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After Societal Cataclysm**

Robin A. Cantor
Stuart Henry
Steve Rayner

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**MARKETS, DISTRIBUTION, AND EXCHANGE
AFTER SOCIETAL CATACLYSM**

Robin A. Cantor
Stuart Henry
(Eastern Michigan University)
Steve Rayner

Energy Division
Oak Ridge National Laboratory 37831-6205

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19 ABSTRACT (Continue on reverse if necessary and identify by block number) → The report identifies constraints and opportunities for the restoration of economic exchange following nuclear war. Four survival scenarios are postulated based on high or low levels of damage to (1) institutions that signal trading opportunities, reduce transaction costs, and regulate and enforce contracts, and (2) resources that are used to create and define wealth. The four scenarios are <u>best case</u> , <u>worst case</u> , <u>resource abundance</u> , and an <u>institution intensive case</u> . Three kinds of literature were reviewed, (1) the economics literature on formal markets, (2) the sociological literature on informal markets, and (3) the economic anthropology literature on pre-capitalist and pre-industrial exchange. From this corpus a set of non-market and market <u>exchange structures</u> are derived and rendered as <u>rules vectors</u> describing their operation. Each of the four survival scenarios is expounded as a subset of the possible exchange structures that is logically compatible with the constraints defining that scenario. (Over)			
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This procedure yielded a range of tentative conclusions for all four scenarios. First, property rights in surviving resources are likely to be problematic in all but the best case and may place severe pressures on dispute resolution mechanisms and cival order.

Second; barter is not always less efficient than money, as is usually assumed. It may overcome trading difficulties where prices take time to adjust to changing supply and demand information. Attempts to restore currency where national institutions have been destroyed, will depend upon the credibility of the institution that emerges to underwrite it.

Third, prestige exchange is inextricably linked to conspicuous consumption and, sometimes, the extravagant destruction of property. Nevertheless, it may be a necessary precursor to the establishment of trust between traders as well as the restoration of currency and credit.

Fourth, planning for the recovery of markets for particular goods should recognize that there will be major shifts in supply and demand. The value of goods and services may undergo tremendous changes that are difficult to detect from price information, even where it is available. Also, the uses to which goods and services are put systematically lose their attractiveness because of socially generated changes in demand.

Fifth, a critical problem will be the maintenance of trust and authority. The more drastic the change from pre-attack society, the more difficulty people have in deciding whom to trust, who has the skills that they advertise, and who will behave with fiduciary responsibility.

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TABLE OF CONTENTS

PREFACE	v
EXECUTIVE SUMMARY.....	xi
ABSTRACT.....	xix
1. NUCLEAR WAR AND ECONOMIC RECOVERY.....	1
1.1. UNCERTAINTIES IN MODELING NUCLEAR SURVIVAL.....	1
1.2. FOUR SURVIVAL SCENARIOS.....	1
1.3. COMPARISON WITH OTHER SURVIVAL SCENARIOS.....	3
1.4. WILLINGNESS TO TRADE.....	4
1.5. DURABILITY OF VALUES AND CULTURAL CHANGE.....	5
1.6. ECONOMIC RECOVERY.....	8
1.7. CONDITIONS FOR SUSTAINABLE RECOVERY.....	11
2. THE NATURE OF MARKETS AND ECONOMIC RECOVERY.....	13
2.1. THE MARKET IN ECONOMIC THEORY.....	14
2.2. A GENERAL DEFINITION OF THE MARKET PROCESS.....	18
2.3. MARKET STRUCTURES.....	21
2.4. CONCLUSION.....	22
3. EXCHANGE AND MARKET STRUCTURES AS RULES VECTORS.....	25
3.1. MODELING EXCHANGE AND MARKET STRUCTURES.....	25
3.2. RATIONALITY.....	26
3.3. RECIPROCITY.....	29
3.4. A FRAMEWORK OF EXCHANGE STRUCTURES.....	30
3.5. RULES AND EXCHANGE STRUCTURES.....	31
3.6. SOURCES OF EVIDENCE FOR THE RULE VECTORS AND EXCHANGE STRUCTURES.....	34
3.7. CONCLUSION.....	35
4. NON-MARKET EXCHANGE STRUCTURES.....	37
4.1. SUBSISTENCE EXCHANGE.....	37
4.2. PRESTIGE EXCHANGE.....	40
4.3. INTIMATE EXCHANGE.....	45
5. MARKET EXCHANGE STRUCTURES.....	49
5.1. THE PEASANT MARKETPLACE.....	49
5.2. THE ASSOCIATIONAL MARKET.....	51
5.3. THE CRIMINAL VARIANT OF ASSOCIATIONAL EXCHANGE.....	54
5.4. PERFECT COMPETITION.....	55
5.5. THE MONOPOLY MARKET.....	58
5.6. IMPERFECT COMPETITION.....	61
5.7. OLIGOPOLY.....	62

5.8. LESS THAN PERFECT COMPETITION AMONG MARKET CONSUMERS.....	64
5.9. LINKAGE TO SCENARIOS.....	65
 6. THE BEST CASE.....	67
6.1. LEVEL AND SCOPE OF THE RECOVERY EFFORT.....	67
6.2. ECONOMIC RECOVERY WITHIN THE DISASTER AREA.....	68
6.2.1. Exchange Structures of the Groups Included in the Recovery Programs.....	68
6.2.2. Exchange Structures of the Groups Excluded From the Recovery Programs.....	70
6.3. FUNCTIONS.....	71
6.4. CONCLUSION.....	76
 7. THE WORST CASE.....	79
7.1. LIFE WITHOUT CIVIL SOCIETY.....	79
7.2. HIGH RISK AND SCARCITY.....	83
7.3. FUNCTIONS.....	85
7.4. CONCLUSION.....	90
 8. THE RESOURCE ABUNDANCE SCENARIO.....	91
8.1. COORDINATION OF RESOURCES.....	91
8.2. SURPLUS RESOURCES.....	95
8.3. FUNCTIONS.....	98
8.4. CONCLUSION.....	101
 9. THE INSTITUTION INTENSIVE SCENARIO.....	103
9.1. MANAGEMENT OF SCARCE RESOURCES.....	104
9.2. LOSS OF MARKET FLEXIBILITY.....	105
9.3. DEMAND AND SUPPLY OF PUBLIC REGULATION.....	106
9.4. ESSENTIAL GOODS AND SERVICES.....	109
9.5. UNCONTROLLED MARKETS.....	112
9.6. FUNCTIONS.....	112
9.7. CONCLUSION.....	115
 10. CONCLUSIONS.....	117
10.1. PROPERTY RIGHTS.....	118
10.2. CURRENCY VERSUS BARTER.....	119
10.3. DEMAND AND SUPPLY.....	120
10.4. CHANGING MODES OF PRODUCTION.....	121
10.5. TRUST AND AUTHORITY.....	121
10.6. THE SHIFT FROM NON-MARKET TO MARKET STRUCTURES.....	122
10.7. FURTHER RESEARCH.....	124
 REFERENCES.....	127
APPENDIX A.....	A-1
APPENDIX B.....	B-1

PREFACE

The Federal Emergency Management Agency (FEMA) is responsible for coordinating national planning concerning emergency preparedness, natural disasters, civil defense, major industrial accidents, and mobilization of resources for national security purposes. These activities place the agency in the role of a risk manager and, in some cases, make it responsible for planning where too little is known about the likelihood or consequences of the risk. One area where risk analysis and management are particularly difficult is preparing for a societal cataclysm, for example, on the scale of nuclear war.

Among the research areas related to this risk are issues pertaining to the restoration of the mechanisms for exchange and distribution of goods and services in the wake of societal cataclysm. Investigations of this type present two major challenges to the analyst. First, the range of uncertainties involved implies that the number of possible scenarios to be examined must be capable of providing sufficient insight to be useful for planning purposes, while reasonably limited in number to be feasibly researched. Second, the unique nature of this problem implies that the theoretical and empirical evidence must be extracted from a number of disciplines, including anthropology, economics, and sociology. Thus, the investigation requires the construction of a novel approach merging very diverse bodies of existing research.

This study of post nuclear-war markets arose from previous FEMA sponsored research at Oak Ridge National Laboratory (Hill 1987) addressing questions of post-disaster economic recovery and what would be the best way to distribute goods and services following a nuclear cataclysm. The body of economics literature reviewed by Hill indicated that market mechanisms would be the most rational solution to this question, but did not address the question of what constraints the conditions of survival would place on post nuclear-war markets. A major recommendation of Hill's study was that further analysis was needed to understand how institutional damage would affect market activity.

Hence, our research question concerns the socioeconomic conditions that would have to pertain for rational mechanisms of distribution and exchange to function in the wake of a major societal disaster. Specifically, what kinds of markets would be viable following the destruction or severe impairment of existing institutions, which regulate and enforce contracts, and resources, which define wealth? By institutions we mean social agencies and rules whose functions facilitate demand and supply transactions. Institutions therefore include currency, stock and commodity exchanges, courts, legislatures, and regulatory agencies.

One strategy here would be to extrapolate from existing experience on the effects of natural disasters on markets. However, this might not be the most fruitful approach because the effects of natural disasters are usually so localized that the general system of law and of

institutions to enforce contracts and regulate transactions, can be assumed to have survived, at least beyond the area of immediate devastation.

Even where these mechanisms are impaired or destroyed locally there will be, in the United States at least, a higher authority with external resources to step in and restore order (Mileti et al 1975; Haas et al. 1977). Past experience with natural disasters suggests that there is not the opportunity to establish new institutions governing patterns of distribution and exchange, the enforcement of contracts, and maintenance of property rights.

In the case of a major societal catastrophe, the survival of a broad economic and legal infrastructure governing markets cannot be assumed, even where there are surplus goods and services and willingness to participate in exchanges. Hence, novel adaptations of familiar market arrangements may arise, according to local circumstances, in order to maintain trust between economic agents or to substitute confidence in an institution that will enforce contracts where that trust is missing. This report represents a comparative evaluation of how market exchanges and property rights are likely to be maintained under alternative institutional arrangements that may arise.

Although the results of natural-disaster research are of very limited help to this research, it was considered prudent to examine the guidelines offered by disaster-planning research in constructing a research design for modeling post-attack markets.

In one very important aspect the two problems are identical in that, "the ultimate goal in such planning is to enable an effective and efficient start towards the restoration of normal routines" (Dynes et al. 1981).

The problem is similar to natural disasters in that FEMA has very limited influence on the occurrence of the disaster event. To some extent, FEMA is constrained to accept the position that planning is necessary to reduce the uncertainty of the event following societal catastrophe, rather than preventing the catastrophe from happening.

The parallel problems suggest that planning for societal disaster may benefit from existing guidelines for natural-disaster planning. However, a closer examination of major specific guidelines reveals that some guidelines are very applicable while others are inappropriate and, if applied, could be misleading for societal-disaster planners. Below, we consider four of the important disaster planning guidelines from the literature on natural disasters.

1. Emphasize the appropriate over the fast response. This guideline is particularly important for the market problem since other response concerns are likely to dominate in the period immediately following the disaster. In fact, the restoration of market activities generally does not reflect the crisis characteristics of what we consider emergencies. Thus, determining the appropriate response is likely to depend on allowing a sufficient amount of time to elapse so

that potential trading agents are less concerned with emergency activities and have begun reconstruction of social, political, and economic relationships.

2. Plan for most likely probability. This guideline is appropriate in the natural-disaster context, where data exist from which probability information can be drawn. The lack of actual data even remotely applicable to our disaster event implies that we would have great difficulty in specifying most likely cases. Thus, considering a limited number of extreme cases is more suited to societal disaster planning. This follows from the need to keep the planning process tractable, while recognizing that the unusual may occur. Lack of direct experience from which to define likely scenarios is one of the more difficult problems of planning for societal cataclysm.

3. Focus on principles. Given that uncertainty is prevalent in the analysis, we believe that this guideline is crucial to the planning research design. We structured our analysis to emphasize the rules by which social interactions and exchange are governed. By doing so, we were able to specify market structures as packages of rules governing demand, supply, and transactions. This specification allows direct comparison among the different types of market structures. More importantly, it facilitates the identification of social or technical conditions that give rise to particular rules and suggests principles to follow which account for these conditions.

4. Only exercised plans are realistic. Although sensible in concept, this guideline is not very practical for the global disaster problem. However, we agree that some application of the potential policy is desirable. For the market problem, this implies some application of the policies that are recommended to facilitate market exchange under various assumptions regarding the surviving infrastructure and resources. Alas this was not possible in the terms of the present study, however, one possibility for future research would be to use experimental economic methods (Plott 1986, Smith 1986) to construct defined market structures under which participants may exchange.

An additional set of guidelines emerged as a result of our research of the market problem that we believe can be useful to similar planning questions. These guidelines are more concerned with disaster-planning research design, an area not well explored in the natural-disaster planning area. This is not an oversight of the natural-disaster literature, since such research is strongly based in actual disaster-response experiences. Without the benefit of actual data, the societal disaster planner must rely on a well-developed research design to suggest the possible circumstances that will necessitate a response. Furthermore, the research design must be capable of suggesting the efficacy of possible disaster responses, again without the benefit of real-world applications.

1. Limit the possibilities in a meaningful way. This guideline encourages the development of a defensible framework for determining the logical possibilities. Furthermore, given the number of scenarios that may be generated from incremental changes in the important variables, some reasoning also is necessary to constrain the analysis. In our study, we specified the range of initial scenarios within which institutional adaptations could arise in the wake of large-scale material and institutional devastation. Any such catastrophe may be presumed to affect existing markets in two important ways: 1) destruction of resources (skills, goods, and currency to exchange), and 2) destruction of institutions. Depending on the extent of the catastrophe and the location of the affected market, either or both of these factors may sustain light or heavy damage. The possible combinations of these factors generate four distinct scenarios, described in chapter one, and determine the initial conditions for the development of possible post-disaster market arrangements.

2. Guidelines should combine models and disciplines. Societal-disaster planning problems will necessarily involve questions addressed by different literatures and conceptual models. In order to specify the necessary conditions for markets to operate under each of the above scenarios, this report reviews the theoretical foundations of the concept of exchange in economics, sociology, and economic anthropology. Existing studies of unconventional and traditional markets are examined to see how exchanges actually occur in conditions other than the ideal situations postulated by theoretical models. The resulting framework is then applied to the four scenarios in order to generate the necessary conditions for market activity in each case and to explore policy-relevant factors. Thus, some guidelines must be followed in the research design to combine this diverse information. Three aspects of combining diverse literatures were particularly important for our research design problem.

First, it was important to recognize inconsistencies across and between levels of analysis. To study the rules governing exchange within each scenario, we referred to models of exchange from anthropology, economics, and sociology. Unfortunately, these models are rarely consistent with each other, especially with respect to the level of analysis. Thus, models of collective, individual, social-network, firm, and industry behavior were reviewed. One of the more difficult problems was determining which level of abstraction in these models was appropriate to provide useful information to the analysis without losing a realistic perspective. For example, we resisted the reductionism of formal economic models that rely on the extreme version of utility theory. At a high level of abstraction from social-network factors, these models tend to represent market decisions using only the individual perspective, where all factors are reduced to individual costs and benefits.

A second consistency problem emerged in the combination of different areas of applied research. We based the characteristics of markets, with varying conditions and levels of participation, on existing evidence from four fields of study. These fields included formal market behavior in economics, past efforts at emergency rationing

and market regulation, informal economies in peace and wartime, and primitive markets and trading. Many of these areas have been seen as incompatible by other researchers. However, we found that by transforming the information into the rules governing market behavior and exchange, we were able to construct a common framework for the study areas. The rules approach allowed us to compare the very diverse applied research in a consistent and efficient manner.

Finally, pooling diverse research areas to address the global disaster planning problem reveals a number of unanswered questions as well as generating some new ones. The research design must acknowledge these questions to point out important areas of missing information underlying the recommended planning actions. For example, one surprising finding was that no rigorous and consistent definition could be found for a free market in all of the literature examined. Although we uncovered a number of very specific definitions, we found they ranged from the general idea of a sphere where supply and demand come together (Miller 1978) to only those transactions that are conducted among completely anonymous traders (Williamson 1985). Thus, the first definition includes just about every exchange imaginable, while the second excludes any market where contracts or social-networks are present. Finally, unanswered questions inevitably are raised by our analytical framework since the rules derived from theoretical models are extremely difficult to test while the rules derived from applied work in other cultures may not be valid for the surviving U.S. population.

3. Beware of the ethnocentric influence of past research, existing theoretical or empirical information. Economic theory generates universal models of markets, however, these are applied to real-world situations in which the constraints on exchange behavior are limited to a range of factors that are familiar to citizens of modern industrial societies. The environmental and social-structural constraints may be very different in post-attack society, particularly under the scenarios where institutional damage is great. It may be erroneous to assume that survivors will continue to trust in the pre-attack institutions and ways of doing things that they maintained prior to the disaster. The continuation of pre-attack preferences, values, and cultural priorities, likewise, cannot be wholly assumed. The constraints on exchange may more closely resemble those pertaining in societies or relationships that are very different from current US experiences. Instead of market activities that are driven by the influences of supply and demand, allocations may tend to be fixed by rules other than market choice.

Most economists and formalist anthropologists do not consider that primitive or traditional markets operate or are motivated by factors that differ in any significant respect from those used to model modern capitalism. Other schools of anthropology, so-called substantivists, claim that the exchange systems of traditional societies are exempt from universal modeling. Formalist generalizations may be ultimately vacuous at their extremes (if everything one does is defined as maximizing one's utility function, utility maximization becomes tautologous as an explanation of behavior). On the other hand, substantivist explanations are ultimately limited, since they only permit us to appreciate the

variety of cultural patterns without being able to make helpful comparisons.

We have sought to join the growing body of anthropological economics that avoids this polarization (Cook 1970). Our approach has been to render exchange systems as systems of rules, and we have included constraints such as traditional allocation rules in our ideal-typical models. Thus we have sought to retain the benefits of generalization offered by economic models without losing sight of the breadth of human ingenuity in regulating its economic behavior.

We have also violated an established distinction between economic and social factors in explanations of human behavior. Following Homans (1958) and Schneider (1974) we envisage both social and economic behavior as essentially systems of transaction involving the exchange of both material and non-material goods. A similar view is adopted by economists such as Smith (1974) and Hirshleifer (1985).

Because of a number of ethical issues raised by this study, we conclude our preface with some thoughts on the researcher's moral dilemma when engaging in societal disaster-planning research. In general, these problems do not confront the natural-disaster planner whose role is regarded as necessary and, to some extent, a public good.

First, it is often argued that societal-disaster planning may be admitting defeat in the sense that being prepared makes the event seem more acceptable and, therefore, more likely to occur. This concern is raised frequently concerning research into man-made global disasters such as nuclear war or carbon-dioxide induced climate changes (Gerlach and Rayner 1988). Opponents of this kind of research apparently prefer to rely on the strategy of "just say no" to societal disaster.

Second, because so many of the critical policy options are untestable in the pre-disaster world, there is an additional burden placed on the planner regarding the consequences of being wrong.

In contrast, the positive aspects of this research should be acknowledged. Thinking the unthinkable provides an opportunity to foster new ideas about old areas of research, even stimulating new criticisms of accepted conventions in research areas. There are spin-off contributions to other areas of study. For example, our work has important implications for research into economic development.

Finally, there is the consideration that a moral obligation exists to use pre-attack research skills in order to leave societal-disaster survivors with the best possible information. In the following chapters, we attempt to contribute to such a body of knowledge.

EXECUTIVE SUMMARY

This document examines the social and economic conditions for reestablishing rational market mechanisms of distribution and exchange following a nuclear war or other major societal disaster. Two variables are used to define the circumstances of survival under which post-disaster economic activity is envisaged. These are:

(1) the level of institutional survival affecting regulatory systems, banks, stock exchanges, enforcement agencies, etc; and

(2) the extent of remaining resources, such as land, products, and machinery, as well as human resources such as labor, skills, and knowledge.

Combining these key produces four extreme survival scenarios. These are:

(1) best case, in which both institutions and endowments survive largely intact;

(2) worst case, in which both resources and institutions suffer heavy damage;

(3) resource abundance, where the resources survive but the institutions suffer heavy damage; and

(4) institution intensive scenario, where resources are considerably restricted but the institutions, including government, remain strong.

GENERAL CONDITIONS FOR ECONOMIC RECOVERY

Economic recovery is defined not as the restoration of modern industrial capitalism but as the achievement of a sustainable system of production and exchange that lays the conditions for subsequent economic and technical development. To establish this we identify eight primary functions that are general conditions of any sustainable economic activity and six secondary functions that emerge to increase the efficiency of trading once it exists.

The primary functions are: defining property rights; conveying information; providing a marketplace; limiting the provisions of legitimate contracts; non-coercive enforcing of contracts, settling disputes; maintaining civil order; and legitimating the other functions.

The secondary functions are: guaranteeing currency; administering distributive justice; monitoring operations; mitigating risk; exploiting comparative advantage, specialization, and the division of labor; and reducing transaction costs.

A MARKET PROCESS

The economics literature reveals that little attention has been given to understanding how markets emerge from social interaction. We also were unable to find any consensual definition of the market process. From the variety of approaches reviewed, the following five-part definition is derived:

- (1) while an accepted shared definition of property rights must exist to define control over goods and services, the absence of private property rights does not preclude market process;
- (2) there must be a desire to exchange based on differences in personal tastes and endowments which present an opportunity to gain from exchange;
- (3) the perceived gains from an exchange must exceed all the costs from completing the transaction;
- (4) traders must have some choice over trading partners and/or trading periods; and
- (5) there must be trust that the exchange will be completed in an atmosphere of non-coercion.

A market process exists where these conditions are present for at least two or more traders who are able to exchange goods and services where the options are wider than to exchange or not to exchange. This general definition is not dependent on the existence of any particular form of organizational arrangement but, in practice, is constrained by social institutions and the rules governing individual behavior within economic interaction.

EXCHANGE STRUCTURES

We define a combination of the rules governing demand, supply and transaction options for a particular set of transactions as an exchange structure. Where the exchange structure fulfills the conditions of the market process, it is also a market structure but the reverse need not be true.

The packages of rules (rules vectors) that describe each exchange structure are drawn from literatures on ideal types of markets and empirical descriptions of specific situated markets. The complete rules vector for each exchange structure includes: demand rules, that regulate the types of traders who can signal their intentions to obtain goods or services; supply rules, that regulate who may supply goods and services and how supply is affected by technology; and transactions rules which govern choices over transaction options. Such a framework is of sufficient generality to include exchanges in the financial, familial, and group spheres and is also sufficiently interdisciplinary to transcend the myopia of disciplinary specialism. It acknowledges the interrelationship of formal markets with their informal counterparts

while, simultaneously, accommodating primitive and subsistence forms of non-market exchange.

The non-market structures consist of:

(1) subsistence exchanges, comprised of small, co-residential groups of producers and consumers, limited in their productive capacity by simple technology, elementary storage capabilities, low division of labor, and restricted geographical range;

(2) prestige exchange, which consists of the ritual transfer of certain restricted items held in high esteem by the participants;

(3) intimate exchange, which occurs in extended family networks, self-help organizations, co-operatives and communes. The object of exchange is to emphasize interdependency while providing otherwise unobtainable goods and services. (This exchange structure is particularly relevant to post-disaster recovery, because it shows how non-market exchange structures co-exist with the market exchange structures of industrial society.)

Market structures consist of:

(1) peasant market exchange, consisting of people who produce primarily for trade in localized marketplaces rather than for self-sufficiency;

(2) associational exchange, motivated by a desire to obtain goods at below market price, or those in short supply, but it also provides status. Where goods and services are directly illegal and result from theft, vice, and smuggling, a separate, if sometimes overlapping, criminal variant of this type of exchange exists;

(3) perfect competition, where the large number of buyers and sellers have equal and easy access to the market, and demand and supply a diverse range of goods and services;

(4) monopoly exchange, where there is only one supplier and no close substitutes for goods and services;

(5) oligopoly exchange, where a small number of suppliers dominate the market; and

(6) imperfectly competitive exchange, where the number of sellers is so large that no one firm has market power and there is easy exit and entry, and where a minor attribute of any one supplier differentiates it from rivals.

THE BEST CASE

Under the best case post-disaster scenario the nation's institutional infrastructure including government and finance, and most of its resources, survive the limited nuclear exchange. Consequently, all of the exchange structures can be expected to be present in varying degrees, and the contemporary U.S. economy serves as a baseline for comparison. Recovery in the disaster area is considerably influenced by the capacity of these exchange structures to lend assistance and the national economy is affected as a result of its concentrations on recovery. Reconstruction is likely to take the form of restoration of the basic institutional infrastructure either without or with resource development.

Research on regional disasters is highly relevant to this scenario and shows that overall the disaster-area economy suffers no long term negative effects and often a positive effect as a result of the inflow of outside resources, such as funds and capital assistance from federal and state agencies. However, these relief programs alter the balance of exchange structures. Community networks emerge to deal with recovery efforts and to strengthen demand-side market power. Procedures to distribute relief funds may purge inefficiencies of pre-disaster imperfect competition, such as oligopolistic pricing. New firms enter the area, increasing the tendency to perfectly competitive exchange structures. Perfect competition is facilitated by increased information flows resulting from the government's assumption of information costs and the reduction of risk through subsidies for new businesses. Under the best case scenario, the functions necessary for sustaining economic recovery are performed by the same institutions that perform these currently.

THE WORST CASE

In the worst case scenario both resources and institutions sustain heavy damage. This means the collapse of currency and banking, loss of records of property ownership and pre-attack contracts, absence of law enforcement, insurance, and other mechanisms of risk reduction. Armed militia, survivalist groups, religious and secular arbitrators, and bandits exist as the primary power brokers defining property rights and acting as independent economic units in this environment of scarce resources and fragile, decentralized authority.

The principal productive unit is the extended family, which accounts for the exchange and consumption of subsistence goods through intimate and associational exchange networks. Military gangs are an important additional consumption unit as well as a supplier of security services. The risk-reducing benefits of intimate and associational trading is especially important in times of high uncertainty.

In the scramble for surviving resources, survivors may develop a domestic mode of production in which currency will be displaced by barter for exchanges of subsistence goods and a system of fixed allocations may be established. Currency is likely to be confined to the prestige sphere, or for obtaining particularly lumpy goods, and

probably will consist of precious metals and gems. Major shifts in demand and supply are likely as there will be a strong incentive for communities to restrict the range of wants among members to avoid disruption from demands that cannot be satisfied.

THE RESOURCE ABUNDANCE SCENARIO

The resource abundance scenario is based on the assumption that material and human resources survive a cataclysmic disaster while the institutional infrastructure of industrial society is heavily damaged. Under these assumptions, there is no currency, banking, commerce, or government, except for that which exists at a local level. Unable to sustain the social organization necessary to sustain production of specialized industrial goods, a society in this scenario is likely to make use of the non-specialized self-sufficiency of domestic production. While producing at a low standard of living there may be high satisfaction among survivors because of lowered expectations. Given the absence of money and significant levels of uncertainty, little incentive exists to engage in material exchange but associational and prestige exchange may emerge using barter to cement social bonds. Prestige and the enhancement of social relationships may become the main incentives for trading.

Contract enforcement, dispute settlement, and the maintenance of civil order may occur via the remaining local courts and legal system, which is now decentralized and without a national framework. Alongside the courts, other methods of dispute settlement may arise such as settlement-directed talking or community mediation. Here justice is negotiated and greater use is made of pre-existing private-justice institutions. Finally, resource abundance provides significant possibilities for a return to industrial market-exchange structures based upon the surviving energy sources and existing local, decentralized institutions.

THE INSTITUTION INTENSIVE SCENARIO

Finally, the institution intensive scenario is considered. This is based on the assumption that resources are destroyed but the institutions of government, banking, and commerce, survive. Evidence from American and British wartime experience shows that government can be effective in managing consumption, transportation and agricultural production through the use of rationing, quota setting, regulations, subsidies and price controls. Public compliance was high but support for such policies also was affected by corporate interest groups who were likely to benefit from the change, and by those groups who were harmed by the costs imposed on them. Reliance on the market mechanism may be undermined by voluntary, self-imposed regulations as corporations seek ways to achieve general recovery and long-term profits.

The use of selective intervention by governments responding to these pressures is more likely to affect markets for essential goods and services. Whether it succeeds will reflect the extent to which it is able to balance market controls with appropriate fiscal and monetary policy. Intervention through fiscal policy uses taxation,

subsidization, and government procurement to shift supply and demand, so as to alter production and consumption processes. Monetary policy may be used to remove purchasing power from demand and direct resources. If government controls and intervention are not popular, informal associational and criminal economic exchange structures will arise, as has occurred in Eastern Europe and many developing countries.

The government is likely to perform such functions as: the conveyance of supply and demand information; the legitimation of other functions; mitigation of risk; and the reduction of transaction costs. We expect a much narrower range of formal market structures to function in the post-attack environment because of the absence of resources to support market diversity and the factors commonly underlying market failure. In these circumstances surviving groups are likely to increase demands for government intervention.

CONCLUSIONS

Examining the ways in which the relevant exchange structures may combine under each of the four scenarios points to a range of problem areas where specific policies need to be developed. For the scenarios based on high levels of institutional survival, these policies probably would be directed towards surviving government agencies concerned with facilitating recovery. For scenarios with low survival of institutions, policies probably would best take the form of leaving pertinent information and recovery guidelines for the use of surviving populations. The form in which such information could best be left for survivors also is an issue for further research.

The following conclusions concerning sustainable post-attack economic recovery are of primary importance:

- (1) It will be important to establish appropriate property rights for particular combinations of resources and infrastructure.
- (2) Private-justice institutions will play a significant role in dispute settlement under low-infrastructure survival.
- (3) It will be important, for long-term recovery, to recognize the central role of social bonding through the exchange of goods and services, particularly in the low-infrastructure scenarios. This will warn against a myopic focus on prematurely re-establishing industrial capitalism in advance of the growth of the secure social conditions for its sustenance.
- (4) There are circumstances in which barter actually may be more efficient than cash.
- (5) It will be important to recognize the way money and credit can emerge from prestige exchange systems and not to proscribe, what appears on the surface to be, non-essential, extravagant consumption.

(6) Especially in the high-infrastructure scenarios, it will be important to remain flexible and accommodate changing demand for certain goods and a reduced division of labor.

(7) Surviving national government should recognize the importance of balancing fairness and efficiency in the distribution of surviving essential resources to encourage trust and support for its authority.

We also consider the dynamics of exchange structures as society moves from a low-level of resources and institutions to higher levels. While traditional rules encourage activities that are necessary precursors to many social functions that constitute formal market structures, to have a true market process the traditional rules of fixed allocation must be replaced by rules that expand the transaction choices that are available to traders. Such innovation in the rules may be internally or externally stimulated. The expansion of potential trade opportunities in an environment of civil order provides the necessary conditions for the emergence of middlemen and corporate groups. These institutions respond to incentives offered by the more flexible structure because transaction costs of identification, negotiation, and enforcement are within tolerable levels. Perhaps facilitated by the emergence of a system of generalized currency, these institutions separate the sale and purchase activities of traders and, thereby, reinforce the emerging flexibility of rules governing a market process of resource allocation. This is the core of most commercial U.S. trade.

ABSTRACT

The report identifies constraints and opportunities for the restoration of economic exchange following nuclear war. Four survival scenarios are postulated based on high or low levels of damage to (1) institutions that signal trading opportunities, reduce transaction costs, and regulate and enforce contracts, and (2) resources that are used to create and define wealth. The four scenarios are best case, worst case, resource abundance, and an institution intensive case.

Three kinds of literature were reviewed, (1) the economics literature on formal markets, (2) the sociological literature on informal markets, and (3) the economic anthropology literature on pre-capitalist and pre-industrial exchange. From this corpus a set of non-market and market exchange structures are derived and rendered as rules vectors describing their operation. Each of the four survival scenarios is expounded as a subset of the possible exchange structures that is logically compatible with the constraints defining that scenario.

This procedure yielded a range of tentative conclusions for all four scenarios. First, property rights in surviving resources are likely to be problematic in all but the best case and may place severe pressures on dispute resolution mechanisms and civil order.

Second, barter is not always less efficient than money, as is usually assumed. It may overcome trading difficulties where prices take time to adjust to changing supply and demand information. Attempts to restore currency where national institutions have been destroyed, will depend upon the credibility of the institution that emerges to underwrite it.

Third, prestige exchange is inextricably linked to conspicuous consumption and, sometimes, the extravagant destruction of property. Nevertheless, it may be a necessary precursor to the establishment of trust between traders as well as the restoration of currency and credit.

Fourth, planning for the recovery of markets for particular goods should recognize that there will be major shifts in supply and demand. The value of goods and services may undergo tremendous changes that are difficult to detect from price information, even where it is available. Also, the uses to which goods and services are put systematically lose their attractiveness because of socially generated changes in demand.

Fifth, a critical problem will be the maintenance of trust and authority. The more drastic the change from pre-attack society, the more difficulty people may have in deciding whom to trust, who has the skills that they advertise, and who will behave with fiduciary responsibility.

1. NUCLEAR WAR AND ECONOMIC RECOVERY

1.1 UNCERTAINTIES IN MODELING NUCLEAR SURVIVAL

The study described in this report examines the social and economic conditions under which rational market mechanisms of distribution and exchange can be established following a nuclear war or other comparable societal disaster. As such, the report is not designed to help settle any debate about the probability and magnitude of nuclear devastation or the likelihood of survival for any particular population. As in the case of most large-scale risk analyses of events for which we have no previous experience, the predictions of all attempts to model such impacts depend heavily on the selection of initial assumptions and the choice of modeling programs and techniques (De Finetti 1974, Reaven 1986). Existing scenarios for nuclear war impacts range across the whole spectrum from the broad position that nuclear war would be similar to other kinds of wars and disasters in that it can be survived by taking adequate precautions (Winter 1963; Hanunian 1966; La Riviere and Lee 1966; Goen et al. 1970; Quester 1979) to the view that nuclear war would be a single cataclysmic event leaving nothing for which it would be worth surviving (Schell 1982; Zuckerman 1984).

Since none of these models can be falsified conclusively (Popper 1963) except in the event of a nuclear war, there is no scientific justification for preferring either position. Such judgments are essentially trans-scientific (Weinberg 1972) and ultimately political. Hence, it behooves us to adopt the most objective stance available, that of considering the full range of logical possibilities for nuclear destruction. In discussing the general economic effects of high-level resource destruction, we do not need to be concerned with whether it is caused by blast, fallout, or climatological disruption. Drawing on the entire range of predictions about the effects of nuclear war, it is possible to develop a reasoned and informed foundation for a variety of survival scenarios. In this chapter, we begin by elaborating the conditions necessary for the development of each scenario and identify its characteristics. We also discuss some of the general theoretical assumptions that constitute the starting point for our approach as well as the limitations that we have placed on the scope of our inquiry. Our aim, pursued in the later chapters, is to discuss the kind of market and exchange activity each scenario would possess given our starting assumptions. In this way we seek to prepare the conceptual building blocks from which strategies to deal with real post war situations can be built. However, such strategies are the stuff of future research and beyond the scope of this inquiry into the logical conditions for economic exchange to develop at different levels of destruction.

1.2 FOUR SURVIVAL SCENARIOS

The first step is to specify the range of initial scenarios within which institutional adaptations to contemporary American market

arrangements may arise in the wake of large-scale material and institutional devastation. Any such catastrophe may be presumed to affect existing markets in two important ways: 1) the destruction of resources (skills, goods, and currency to exchange) and 2) destruction of institutions (the social mechanisms that organize production, regulate exchange, and maintain trust in contracts and currencies). This distinction parallels that of Hill (1987) who approaches the problem of US post-disaster recovery by dividing the economy into the physical infrastructure and the institutional infrastructure. Either or both of these components may sustain light or heavy damage, depending on the extent of the catastrophe and the location of the affected market. In our model, the four permutations that result will determine the initial conditions for the development of possible post-disaster market arrangements.

1. Best case: Where institutions and resources survive largely intact (e.g., in rural or urban settings far from the centers of destruction) business is likely to continue as usual, at least until large-scale refugee immigration places a strain on endowments.

2. Institution intensive: Where resources are restricted, but institutions remain intact (e.g., in an undamaged urban location which is unable to obtain goods--especially food--from suppliers elsewhere) heavily regulated exchange, such as rationing, is a likely outcome.

3. Resource abundance: Where resources survive, but institutions are heavily damaged (e.g., in rural areas that are heavily dependent on centralized communications and external markets) self-regulating, informal market activities such as direct barter, are likely to arise.

4. Worst case: Where both institutions and resources suffer heavy damage (such as in the suburbs of a largely destroyed city) informal market activity, subject to might-is-right regulation, is a likely outcome.

Each scenario is presented as a static model. It is assumed, in each case, that we are concerned with peacetime economic recovery and not with a wartime command system of production and consumption. Hostilities are, therefore, presumed to have ended and there is no imminent threat of invasion either by the initial combatant or a subsequent opportunist aggressor. By the same token, we assume that relief aid from friendly countries or war reparations from the combatant are not yet available in sufficient quantities to affect significantly the rate of recovery in the US as a whole.

While these assumptions probably are unrealistic, they help to establish the bounding conditions within which real events would occur. It is equally unrealistic to suppose that any level of destruction would prevail evenly across the United States or that areas conforming to a single scenario will be isolated permanently from those operating under different conditions of survival. Any real survival situation is likely to include interaction between groups of survivors at different levels as well as potential intervention, such as assistance, from foreign countries. However, the complexity of such interactions is beyond the

limited scope of the present study which is to establish the conceptual framework within which such a study could be constructed.

It also is assumed that the initial medical effects of blast and fallout have been experienced by the surviving population. Where medical effects have been light, due either to the small scale or specific targeting of the attack, they will have contributed to a high rate of population survival, as in the institution intensive scenario. Where medical effects have been severe, as in the worst case, they will have exacerbated the initial effects of blast and fallout. Of course, a breakdown of medical services may quickly reduce a high level of population initially surviving an attack, to a state of resource abundance or even to the worst case. Hence the more destructive scenarios we have constructed need not be caused by initial blast and fallout, but may prove to be the result of medical and environmental consequences in the short-term aftermath. In this sense, our scenarios may not be those of the day after, but are intended to describe the first stable states of society that are realized following the initial trauma created by a nuclear war, but prior to interaction with other regions or intervention from other countries.

1.3 COMPARISON WITH OTHER SURVIVAL SCENARIOS

There is some correspondence between the four scenarios generated by our survival typology and those selected by the US Office of Technology Assessment (OTA) for its analysis, "The Effects of Nuclear War" (OTA 1980).

OTA's first case examines the effect of a single nuclear weapon over a single US city (Detroit). Presuming that the population is not adequately protected, the consequences of such an event would be appalling for the inhabitants, estimated at 220,000-2,500,000 dead and injuries ranging from 420,000-1,100,000; most of the injured would eventually die. The OTA projects that even national mobilization of available medical resources would be unable to care for this many injured. Nevertheless, for those parts of the US unaffected by the explosion and fallout, the primary institutions and organizations would continue to function on existing principles with the surviving resources. In other words, for those who escape the direct impacts, business could continue much as usual under our best case scenario.

The second case examines a hypothetical small attack limited to specifically targeted urban/industrial facilities; in this case, oil refineries. In addition to the prompt fatalities, estimated as high as five million in the absence of special civil defense facilities, OTA projects drastic economic consequences. Productivity would decline in all industrial sectors, and some would be eradicated due to the shortage of petroleum products and fuels. There would be strict allocation of remaining refined petroleum products and regulation of the use of private automobiles. In respect of the projected losses of vital endowments relative to the survival of civil institutions, this scenario corresponds to our institution-intensive system of formal allocations.

In the third case, OTA considers a limited counterforce attack on US missile silos and military installations resulting in relatively little direct blast damage to civilians and economic assets. The uncertainties of fallout effects are described as enormous, but considerable economic damage and disruption is viewed as inevitable. Since almost all areas could be decontaminated, in principle, within a few months, the endowments left to individual survivors might be quite extensive. However, the national loss of so many people and the disruption of economic life could be so great as to call into doubt the survival of major institutions of the formal market system. There are, therefore, some parallels between this scenario and our resource abundance scenario characterized by informal markets and trading systems.

The fourth case in the OTA analysis is a very large attack against an array of military and economic targets. Projections of fatalities in this event range from 70-160,000,000 dead during the first 30 days, followed by further fatalities due to severe shortages of medical care, shelter, and uncontaminated food supplies. The ensuing battle to restore production of food, energy, clothing, the means to repair damaged machinery, and of goods to trade with countries that had not been involved in the war, would be accompanied by the race to consume those goods that had survived the conflict and the wearing out of surviving machinery. The long march out of this worst case scenario will depend on society's ability to increase production to meet the rate of consumption before existing stocks are depleted.

Katz (1982) also describes four nuclear-survival scenarios which are comparable to our own and are based on a decreasing order of damage. His first outcome "Biological Survival of Individuals" describes a level of post-nuclear destruction in which individuals or groups survive but without the organized political, social, and economic structure of industrial society. This compares with our worst case scenario. The second outcome is the "Regional Survival of Political Structures" in which some local political units survive but central government is destroyed. This is similar to our resource abundance scenario. Katz' third outcome, "Survival of Central Government," in which central government has control over all pre-attack national territory, compares with our institution-intensive scenario. Finally Katz describes a fourth outcome "Survival Intact of Basic Societal Structure," in which national damage to the social, political, and economic structure is limited. This compares with our best case scenario.

Which ever post-attack scenario is realized, economic recovery will depend upon survivors' willingness to coordinate labor and to trade its fruits. Psychological research on human behavior in the wake of widespread or individual trauma raises the specter of economic paralysis rapidly reducing the surviving society to apathetic subsistence.

1.4 WILLINGNESS TO TRADE

Psychological research on human responses to disasters covers a wide spectrum of models and data sources. There is profound

disagreement about whether experience of cataclysm is fundamentally disabling for survivors.

Disaster researchers appear to be strongly polarized on the issue of post-disaster syndrome (PDS), some arguing that disasters cause severe negative psychological reactions in victims, including withdrawal from social activities which may extend as far as suicide (Moore and Friedsam 1959; Erikson 1976; Gleser, et al. 1981). Others claim that any psychological effects, if they exist at all, are minor and transient (Quarantelli and Dynes 1972; Taylor 1976; Sterling, et al. 1977).

The data used by supporters and critics of PDS vary systematically. Supporters have tended to employ a psychodynamic perspective which draws on direct concern with anxiety, subjective unhappiness and other maladjustments evidenced through clinical interviews and self-reporting. Critics usually base their findings on behavioral models measured by rating scales, observers' reports, or admissions to psychiatric care. However, it is evident that the incidence of PDS, however widespread, depends on three general dimensions: (1) characteristics of the disaster impact; (2) characteristics of the social system; and (3) characteristics of the individual.

It is beyond our scope to attempt to specify the effects of individual psychological predisposition on willingness to trade at the level of analysis proposed for this research. However, the characteristics of the disaster impact will be included in our modeling of the initial conditions described above. The longer the duration of the impacts and extensiveness of their scope, the greater is the likelihood that kinship and friendship networks will be disrupted, resulting in the possibility of diminished participation in social and economic activity (Barton 1969).

Supportive kinship arrangements and friendship networks are important characteristics of the social system, whose survival may be quite independent of the formal economic and civil-order infrastructures. These networks form the basis of any therapeutic community that is key to post-disaster recovery among victims (Drabek et al. 1975; Quarantelli 1980). As such, they are likely to be sources of variation in the level of participation in any markets that arise out of the various initial conditions of survival specified above.

1.5 DURABILITY OF VALUES AND CULTURAL CHANGE

Although we share the view that surviving kinship and friendship networks will be central to post-disaster recovery, we do not necessarily assume continuity in the behavior, values, and preferences that these social arrangements currently embody. This caveat particularly applies when these factors relate to the institutions of broader society beyond the immediate network, such as the nation state itself. While experience of localized disasters has been observed to strengthen existing values and the societal institutions that support them (Drabek 1986), these cases do not involve drastic long-term disruption of large-scale institutional structures. In the case of

nuclear war, the degree of continuity is likely to be high in the best case scenario which most closely parallels our previous experience with earthquakes, floods, and hurricanes. However, under the prospect of drastically changed long-term institutional conditions we assume that social systems and the values that they support will readily adapt. In the worst case scenario we can envisage the construction of local exchange patterns almost de novo and with little concern for pre-disaster legal prescriptions.

The assumption that survivors will build patterns of exchange based on their material conditions of survival and the forms of social organization that these can support may surprise some readers. There is a cherished belief, even among some professional social scientists, in the persistence of cultural values that will be preserved by survivors despite major upheavals in the social structure upon which culture is built. It may be comforting to believe that notions of democracy, justice through law, national identity, and the like are widely shared and deeply held values that will continue to constrain the behavior of most nuclear war survivors simply because these are deeply embedded in the culture that has gone before.

The problem with this belief is that, although individual preferences and habits of thought may survive initial disruption, the ability to transform individual preferences into collective action is dependent upon social organization. That is to say that although the psychological disruption predicted by supporters of PDS may be pessimistic, the evidence from history and anthropology indicates that when organizational forms of society are drastically altered, rapid cultural adaptation occurs. Nuclear war is neither a necessary nor sufficient condition for such drastic institutional changes and transformations in value structures.

For example, the Kampuchean population once had a reputation for being the most peaceable and gentle people of South East Asia, yet the sudden disruption of their traditional patterns of authority and governance resulted in one sizable segment of the population inflicting on its own people the worst genocide the world has seen since the Nazi era (Shawcross 1984). The great irrigation empires of the Orient, the Middle East, and Mesoamerica displayed astounding persistence. However, once they lost their sacred kings and temple bureaucracies (usually to outside invaders) their cultures crumbled with equally astounding rapidity (Wittfogel 1957). Lebanon, once an oasis of peace and religious tolerance in the Middle East has been reduced to a state of permanent warfare in only a decade (Meo 1965, Chami 1983). Air crash survivors today have been known to follow the precedents set by their nautical predecessors of resorting to cannibalism when stranded far from the social system that buttressed their personal beliefs that eating people is morally repugnant (Read 1974).

The cultural survival argument is rooted in a pre-scientific conception of culture. This is the catch-all conception of culture as an explanation of last resort to be invoked when social or economic explanations for collective human behavior are exhausted. Yet to state that the Dutch are so clean or the Italians demonstrative because of

their culture is simply tautologous stereotyping (Douglas 1978). It also represents an essentially static view of culture rooted in methodological individualism. The notion that culture consists of a package of enduring values carried in the minds of each individual member of society is quite at odds with modern cultural theory and its practical applications (Gross and Rayner 1985).

A whole generation of anthropologists deployed the term culture in so many ways (Krober and Kluckhohn 1952) that it became a distinctly unfashionable concept in Anglo-Saxon anthropology. However, since the 1960s, a concerted effort has been made to develop a scientific cultural theory, independent of psychology, capable of prediction (rather than mere description) and of falsification. According to this view, culture may be defined as a socially constituted sphere of discourse specified by the type of social organization adopted by its participants. While any topic may be the subject of the discourse (e.g. Marxism, democracy, the environment) the kinds of argument that can be introduced coherently are limited by how people experience social organization in their daily lives (Douglas 1986). If any population is characterized by a high level of face-to-face interaction within distinct organizational boundaries, it makes good sense to appeal to its members to act for the common good, but such arguments will have little chance of success where social interactions are fragmented and transitory. In the latter case, pointing to opportunities for individual advancement is more likely to produce the desired result. Similarly, to argue for the exclusion of an individual from employment on the basis that the job is "not women's work" or is a "young man's job" makes sense when gender and age are relevant factors in social structure, but is irrelevant in strictly egalitarian contexts.

We know that in the course of a day highly mobile individuals moving between different types of social organization shape their arguments to enhance their success in each context. The culture of each institution or organization does not, therefore, consist of a set of static values in the heads of its members, but of the constraints and opportunities placed on public discourse by the structural forms of social relationships themselves. Change the institutional context and any individual will have to modify the way his or her particular preferences are translated into social action. Strip away the institutional context, as in our worst case and resource intensive scenarios, and individuals will have to remake institutions with the social organization that they have left. In these scenarios, this refashioning is more likely to be based on family and local community structures than those of the now absent nation state.

Perhaps more profoundly, one needs to question the reality of shared national core values even before major upheaval. Close examination of values expressed in different constituencies of American society today reveals major discrepancies in interpretation of the central concepts that provide an illusion of uniformity. Scrutiny of the core values of American society reveals that apparently unanimous support for democracy, government by consent of the governed, depends on creative ambiguity about quite different, often incompatible principles for obtaining consent to governance (Rayner 1984, MacLean 1986),

including revealed consent, explicit consent, and hypothetical consent, as well as about the proportion of consenters required to make a decision (ranging between 50% +1 to an unopposed consensus).

The existence of widely shared core values in normal times may be more of an appearance based on assumed reciprocity of perspectives than it is a reality. The cohesiveness of modern complex societies rests on institutions that are capable of combining conflicting goals and interests without explicitly recognizing their diversity let alone reconciling them (Cyert and March 1963).

In those survival scenarios where such institutions are suddenly removed, there is every reason to suppose that surviving communities will have to innovate and that new institutional forms will emerge. To the extent that pre-disaster knowledge will guide individual preferences, people may try to reproduce institutions to match those destroyed. However, our premise is that such efforts will be severely constrained by the new circumstances.

1.6 ECONOMIC RECOVERY

Whatever combination of psychological effects and socio-cultural constraints help to shape the opportunities for economic recovery in any one of the four survival scenarios, there are some general considerations about the nature of recovery that apply to all possible cases.

As Greene, Stokley, and Christian (1979) point out, the definition of what constitutes recovery is subjective. Both Winter (1963) and Sabin (1970) suggests that the conditions necessary for recovery from nuclear attack cannot be met unless the losses of population due to failure of the economy to support those surviving the shelter period have been negligible, and the future production of goods and services sufficient to meet consumption requirements of the government agencies and of the population is assured. In this case, recovery is viewed as restoration of the pre-attack economic system in the short term. We assume that this would be possible only in the best case scenario.

If an attack causes the outright destruction of half or more of the US industrial capacity and a similar reduction in the labor force, many considerations contribute to the problems of economic recovery. For example, Greene, Stokley, and Christian list (1979:12):

1. The high degree of specialization of industry which makes for an equally high probability that some part of the production chain will be damaged. (But the existence of many similar competing plants increases the likelihood that broken production chains can be reconstituted.)
2. The flow of raw materials and parts could be seriously interrupted, and plant inventories of goods-in-process might or might not be of future value.

3. Transportation linkages could be disrupted. (But there is great redundancy in the transportation system, especially in trucking. Fuel might be the major limiting factor.)

4. Public utilities such as power, water, and communications could be out of operation in many areas for a long time, curtailing production.

5. Much of the surviving population might be too preoccupied with personal considerations to reenter the labor force.

6. There could be disproportionate losses of managers and highly skilled workers.

7. Lines of authority in many industrial enterprises could be broken. The authority of surviving plant managers to make decisions could be unclear. (The role of government in setting production goals and supporting them with allocations of materials and credit, guaranteed purchases, or establishment of a "futures market" remains unclear.)

8. The markets for which goods are produced may have disappeared with the attack. The "order book" could be worthless as a guide to future production.

9. Money, both specie and commercial deposits, could quickly become worthless. A new money, based on the realities of postattack values, would be difficult to establish. Without a monetary system which represents a reliable "store of value," complex economic activity could virtually cease.

10. Property rights could be in a state of chaos for some time. Many people could have lost everything--real property, securities, jobs. Insurance probably would be worthless in most cases. Other persons in possession of undamaged property, or inventories of food, medicine, fuel, and the like, could become rich overnight. Many of the dead would have died intestate; surviving heirs could not quickly establish their claims; courts would be overwhelmed. There would be cogent demands for war indemnification, with difficult problems of equity, social order, and economic efficiency involved.

Once again, many of these obstacles to economic recovery seem to assume short-term recovery to the pre-attack state. Others, such as willingness to engage in labor and trade, the loss of currency, and disruption of property rights would apply to our more extreme scenarios. The same authors divide post-attack economic recovery problems into two categories; physical problems and managerial problems. These correspond closely to our categories of resources and institutions.

With respect to resources, Greene, Stokley, and Christian (1979) argue that limitations in the ability to predict levels of damage to the various industrial sectors probably lie mostly in the uncertainties

about the type of attack that an enemy would undertake. However, with respect to all levels of physical damage, they list six management problems that would arise (p. 17). These are:

1. maintain communications;
2. get essential transportation, petroleum refining, and utility systems functioning;
3. keep the agricultural industry going;
4. avoid further deterioration of damaged or idle production equipment or facilities;
5. proscribe nonessential activities--at least those that would waste materials in short supply; and
6. mobilize manpower--in particular, to assure that people with specialized skills needed in the recovery effort are used effectively.

Other analysts also have emphasized managerial preoccupations of post-war authorities. For example, Winter (1963) suggests that four of the major tasks for the surviving infrastructure would be the reestablishment of private property rights; the use of money to prevent the inefficiency of a barter economy; price expectations, possibly by operating a futures market and by a limited set of price guarantees; and the traditional government operations in the provision of important public goods and services. These tasks presume the survival of an effective federal government, and therefore only apply to the best case and institution intensive scenarios. The issue of barter, in particular, is considered in the relevant scenarios and our conclusions.

Greene, Stokley, and Christian (1979:18) conclude that:

The dimensions of the postattack management problems are almost limitless. This is an extremely complex and important area that has received only meager attention. For this reason, it has been given somewhat greater prominence in this report than most of the other obstacles to recovery. Unless more creative and imaginative study is applied to develop better strategies for managing the postattack economy, this barrier to recovery could turn out to be the most difficult of all (original emphasis).

These are precisely the problems that we seek to address in the following pages. However, we do not define economic recovery as the short-term restoration of modern industrial capitalism since this is likely to be a long and difficult process in all but the best-case scenario. The route from the worst case to industrial society could span several generations. Hence, we define recovery here as achievement of a sustainable system of production and exchange that satisfies the conditions necessary for subsequent economic growth and technological development.

1.7 CONDITIONS FOR SUSTAINABLE RECOVERY

In order to establish any sustainable economic framework, it will be necessary for a range of functions to be performed either by the market itself, or by the institutions that regulate or engage in economic exchange. Fourteen such functions can be identified from the social-science literature, eight of which are primary or constitutive functions in that they collectively comprise the exchange activity. Six further functions can be identified as secondary, or emergent functions in that they are not essential to exchange at its inception, but will emerge as exchange persists, usually as instruments of increased efficiency. These functions are listed below.

Primary functions:

1. Define property rights.
2. Convey supply/demand information (including advertising).
3. Provide opportunity for legitimate transaction.
4. Limit provisions of legitimate contracts.
5. Enforce contracts other than by physical coercion.
6. Settle disputes.
7. Maintain civil order.
8. Legitimate other functions.

Secondary Functions:

9. Guarantee currency and close substitutes.
10. Administer distributive justice, including taxation.
11. Monitor and modify operations in response to changing circumstances.
12. Mitigate risk.
13. Exploit comparative advantage, specialization, and division of labor.
14. Reduce transaction costs for intertemporal or interregional transactions (e.g., through credit).

The manner in which each of these functions is fulfilled in each survival scenario is discussed in chapters six through nine. However, any such description needs to be preceded by consideration of the nature of markets and other exchange structures, as described in chapters two through five. Each of the exchange structures described in these chapters consists of a series of rules vectors that provide various

2. THE NATURE OF MARKETS AND ECONOMIC RECOVERY

In contemporary American society, the existence and functioning of markets for a large range of goods and services is taken for granted. However, the questions raised by research probing socioeconomic life following societal cataclysm suggest that much of what is taken for granted is susceptible to challenge. The primary purpose of the following literature review is to offer some insights on the functions that may be considered necessary and sufficient conditions for the restoration of market activity following a major societal disaster of the order of nuclear war.

Two considerations guide our effort in this review. First, we diverge from the traditional focus of most neo-classical economics and concentrate on the processes of market activity rather than the equilibrium state. (More precisely, the area of economics that focuses on equilibrium states is called Neo-walrasian analysis.) Processes of market activity refer to the dynamic considerations of exchange while the equilibrium state is solely concerned with static results of exchange behavior. This approach is necessitated by our interest in the dynamics underlying market creation, participation, and the consequences for economic recovery.

Second, we do not seek to judge whether or not the free-market process is the optimal form of economic organization, even if, as we discuss below, we could define this process adequately. The principal interest of this study is in the conditions for recovery of stable, market activities. However, other forms of economic organization, e.g., traditional or command systems, may be more likely given the assumptions of any particular scenario. Our analysis yields recommendations that could enhance the conditions necessary for the establishment of a market process as well as precautions where actions would be counterproductive or destructive. Yet, to judge how economic life should be reconstructed after societal cataclysm is ultimately a political and ethical question, beyond the scope of our analysis.

Finally, our consideration in this review goes beyond the conditions established by mathematical economic models of market exchange. Although these models are very relevant to the recovery problem, it would be inappropriate for the recovery problem to derive a set of conditions from a mathematical model that generates market transactions under the model's assumptions if these conditions and assumptions are unrealistic (Shoemaker 1982, Daly 1982). From a policy perspective, our conditions have meaning only to the extent that they correspond to actual market activities.

2.1 THE MARKET IN ECONOMIC THEORY

Investigation of the modern economics literature reveals that a great deal of attention is paid to the components and outcomes of market activity, but relatively little analysis has been devoted to understanding how markets emerge from social interaction (Gould 1980). This presents a particular problem for our study since economic recovery under the various scenario assumptions involves some aspects of market creation in the wake of destroyed resources and institutions. The dearth of analysis on the emergence of markets is somewhat surprising given the amount and scope of literature that addresses market phenomena. A first step in understanding the necessary and sufficient conditions to generate and sustain markets is to examine some of the more prominent issues that have emerged from the study of the market process in economic theory.

As noted, there has been some analysis of the market making process. However, this literature has concentrated on the function of advertising or search in an environment where market activities are already well established (Gould 1980). The problems this literature addresses can be placed under a more general category concerning the costs of conducting transactions, which are discussed below.

Related to market making is the theme of market behavior, where the incentives and responses of various market agents, e.g., consumers, producers, laborers, etc., are explored in order to understand economic choice and how diverse activities and wants are coordinated. While it would be incorrect to suggest a consensus exists in this literature, two of the more coherent areas of study focus on the theory of consumer choice and the theory of the firm. Consequently, two paradigms of choice behavior that are important for our study are utility maximization and profit maximization. Blaug (1968) provides an account of the historical development of these theories, their roots going back to the nineteenth century with the work of Jevons, Marshall, and Walras.

The market behavior literature is closely connected to many of the original ideas set forth by Adam Smith in what may be considered the bible of market study, The Wealth of Nations. In this seminal work, written in the latter half of the eighteenth century, Smith identified the powerful force of self-interest and the equally powerful force of the competitive market process that lead selfish economic agents, as if guided by an invisible hand, to provide a diverse group of goods and services to satisfy the wants of consumers.

This view of the market process has been extensively modeled and expanded in the modern economic literature, the most notable being the formal modeling of Smith's invisible hand theory and its welfare implications for the economy (Debreu 1959, Arrow and Hahn 1971). Modern economic theory states that under a specific set of assumptions, competitive market outcomes not only equate demand and supply plans, but result in an outcome where no one person can be made better off without simultaneously making another person worse off (Pareto optimality).

Further, once this state has been reached, there will be no internal pressures to move to another set of exchange plans thus reflecting an equilibrium state. Two of the more important characteristics of the competitive equilibrium are the self-regulating nature of competition and the efficient coordination of supply and demand information.

The characteristic of self-regulation, refers to two properties of the perfectly competitive system. First, given some exogenous shock to the system, e.g., a new, large oil field is found, the forces of demand and supply underlying the competitive model will move the economy to a new price/quantity outcome that reflects this new supply. The concept of self-regulation denotes the economy's ability to adjust, without extra-market intervention to a new equilibrium outcome (Arrow and Debreu 1954). The same term also has been used in another way when referring to the competitive model. The second meaning, which emerges in the models of fully contestable markets (Baumol, Panzar, and Willig 1982), principal-agent problems (Stigler 1983), and the notion of consumer sovereignty (Lerner 1944), is related to the way competition regulates self-interested or opportunistic participants to (a) do what they have promised and (b) produce what people want at the lowest price.

Efficiency in the use of information and communication resources to bring about the demand>equals=supply condition, rests entirely on what Hurwicz (1973) calls the "mechanism for resource allocation." In the perfectly competitive model, such a mechanism may take the form of an auctioneer, who calls out prices for different commodities, observes desired purchases and sales at those levels, and then adjusts prices until all desired purchases equal all desired sales. The only information that need be transmitted from the auctioneer to traders is the set of prices that can be incorporated into their decentralized, decision-making processes. While it may take many iterations for such a mechanism to work, i.e., all markets to clear, individual traders do not need to know the preferences, technological options or level of resources of other traders to make their own market plans. In modern markets with a well-functioning price system, the auctioneer is effectively replaced by many accessible retail outlets and low search costs.

On the surface, the self-regulation and efficiency in the use of information characteristics seem to suggest a framework to find our fundamental conditions for a market process. Unfortunately, the perfectly competitive model of exchange underlying the result, is based on very restrictive and somewhat unrealistic assumptions (Bell 1981, Schotter 1985). For example, it ignores the factors that Kirzner (1973) identifies as the prime movers for the market process; asymmetries in market information and uncertainty that give rise to entrepreneurial decisions and active competitive behavior (rivalry). In the perfectly competitive model, competition does not imply active competitive behavior. Rather, it denotes the absence of competition where economic agents act as passive price takers subject to the same information. In a later criticism Kirzner (1981:116) remarks:

Economists have always emphasized the beneficial role of competition in market processes. Sad to say, neoclassical

economics long ago developed a technical notion of static competition which is not only antithetical to that used in everyday layman's speech, but which, more seriously, fails entirely to appreciate the nature and enormous importance of dynamic competition. Not only did neoclassical economics introduce a meaning to the term "competition" which is almost the opposite of its ordinary meaning, but, in so doing, it diverted attention from market processes (original emphasis).

The competitive force in the model is not that firms or consumers aggressively attempt to out perform other rivals, but that there are so many traders that no single trader has any measurable affect on the outcome of prices and quantities. This large-number-of-traders condition, while crucial to the perfectly competitive model, does not fit most actual market activities, where information is asymmetric and/or rivalry is evident. Thus, in real markets, a large number of traders hardly seems necessary although, when coupled with symmetric information and other conditions, it may in fact be sufficient.

Relaxing the condition of large numbers and/or perfect (i.e., symmetric and complete) information has been the focus of the literature concerning market power (Shepard 1979). This literature addresses the conditions that would prevent a market process from obtaining the efficient outcome of the perfectly competitive model, instead, achieving an outcome that implies some waste in the allocation of resources. The models which characterize this literature address imperfect competition (or monopolistic competition), oligopoly, and monopoly. In addition, the comparable cases of oligopsony and monopsony, as well as bilateral monopoly are relevant. (See chapter five for a more complete description of these forms of market organization.) In short, the modeling emphasis is on the conditions that limit the supply of and demand for a good or service and the implications for resource allocation. While important for understanding the range of choices for market traders, this literature generally relies on the perfectly competitive model as a baseline description of the market process. Three major exceptions to this convention are Chamberlin (1933), who focuses on the tendency for firms to distinguish themselves from competitors, Schumpeter (1942), who focuses on the relationship between innovation activities and market organization, and the literature of the Austrian School which focuses on the dynamic adjustments made by economic agents (Kirzner 1981).

Finally, rather than searching for a general definition or set of conditions of the market process in the literature concerning operating market structures, one may look at two areas where formal-market operation is precluded. The literatures on market failure and non-market allocations are relevant to the market process because they emphasize the conditions under which formal markets will fail to exist or are unable to achieve optimal social outcomes (Toumanoff 1984). Three key concepts emerge from these literatures that bear on market processes and resource allocation; transaction costs, externalities, and property rights.

First is the concept of transaction costs, or what Arrow (1969) calls the costs of running the economic system and Williamson (1985) calls the economic counterpart of friction. Transaction costs arise because announcing you have something to sell may not be costless, finding a buyer may not be that easy, and even when you do, buyers' checks can bounce. Toumanoff (1985:531) provides a concise summary of these costs: "Transactions costs occur as resources are used when trading partners attempt to identify and contact one another (identification costs), when contracts are negotiated (negotiation costs), and when the terms of the contracts are verified and enforced (enforcement costs)."

Second is the concept of externalities in consumption or production. Actually, as Arrow (1969) argues, market failure due to externalities is a special case of the general problem of transaction costs. Externalities exist where an individual's gain or loss from a transaction depends on the actions of others. Thus, pollution from a nearby city may affect the farmer's costs of growing crops and hence, the return on the farming activity. Efficiency could be restored if a costless bargain (i.e., one where the costs of making the bargain are insignificant) could be struck between the two parties, i.e., bribe the city not to pollute as much or compensate the farmer for his/her losses (Coase 1960).

However, in many cases it is difficult to correct externality problems because (a) it is too costly to exclude winners or compensate losers in the presence of external effects generated by use of the resources (i.e., bargains are very costly to make) or (b) the bargain depends on the existence of other markets (including markets for information and insurance) that do not exist. For example, Schelling (1978:42) describes a set of transactions where, in the absence of appropriate information and through the processes of sorting, segregation, or integration, market processes fail to bring about the desired social results: "If everyone wants to stay at home and watch the crowds in Times Square on television, there will be no crowds in Times Square, while if everyone wants to join the crowd to be seen on television there will be nobody watching." In such cases, some coordination of individual plans or better information on the plans of others can produce a better aggregate outcome.

A third concept from the literature on market failure (as well as in economic anthropology) is property rights. Property rights refer to the entitlements which define how resources may be used by traders. Because decisions regarding resources are interdependent, societies define and enforce rules to govern the use and consumption of scarce resources as an alternative to the possible violent competition of their members for these resources.

Two alternative systems for defining property rights are private property and common property. The major difference between the two systems is the first assigns property rights primarily to the individual while the second assigns the rights primarily to the collectivity. Contrary to what many economists and non-economists may think, common property does not imply the absence of an entitlement system. The

absence of entitlements would indicate an open-access system (Stevenson 1984). Of course, hybrid systems are also possible, e.g., where ownership entitlements are defined but use entitlements are not.

While many conditions characterize either the private property or common property case, in their simplest forms they embody: (a) a principle for exclusion, i.e., who may use and manage the resource and who may not; (b) a principle for distribution of income and/or costs arising from the use of the property; and (c) a principle for transferring the rights implied by (a) and (b) (Cheung 1983). In addition, Umbeck (1981) reminds us that all property rights are based ultimately on the abilities of the owners (individuals or groups) to persuade others to respect these rights or at least, exclude those who will not.

2.2 A GENERAL DEFINITION OF THE MARKET PROCESS

The market process is central to economic theory and the foregoing review represents only a brief sketch of the research related to it. However, given the position the market process occupies in the economics literature, one might be inclined to believe that this concept has been defined clearly. In fact, the most surprising outcome of a comprehensive literature review is that the market process has been defined in many ways and little or no consensus exists about any single definition. At best, it can be said that most of the definitions fall into one of two categories: general exchange spheres and institutions free of collective action.

The category of general exchange spheres encompasses just about any form of voluntary exchange. For example, Alchian and Allen (1969:63) define the market as: "a non-administered device allowing uncoerced parties to negotiate exchanges." Presumably, any exchange that was not administered by some central authority would be consistent with this definition. As another example, Schelling (1978:23) describes a market as: "the entire complex of institutions within which people buy and sell and hire and are hired and borrow and lend and trade and contract and shop around to find bargains."

The second category of institutions free of collective actions has been used by a number of authors to make a distinction between a market process and a contract process. Thus, these definitions focus on the differences between anonymous exchange and exchange relationships, defined either by contract or membership in an institution, like a firm. However, it would be incorrect to claim that the degree of this distinction is consistent in the market literature. In fact, three views can be identified.

First is the view that markets involve decentralized decision makers attempting to coordinate their desires (Toumanoff 1984:535-6):

Market institutions create a horizontal mechanism for coordinating economic activity between consumers and producers. Private property rights are generally

decentralized, distributed among the individual actors, and market prices act as presumably low-cost transmitters of information, enabling potential trading partners to locate and contact one another. In addition, specialized traders, or middlemen, emerge to bring partners together, lowering transactions costs further. For many transactions, negotiating costs are negligible and enforcement costs are low, because self-interest is the enforcer. For other transactions, in which behavior is difficult to monitor or property rights difficult to define, negotiating or enforcement costs may be significant enough to inhibit trade.

Thus, decision makers are decentralized, but middlemen (coordinators), are within the bounds of the market process. Consistent with this view are those analysts who see the perfectly competitive model as representative of the market process. For example, Hurwicz (1973) discusses "market phenomena" in connection with the Walrasian auctioneer process (i.e., a system of bidding where trade is allowed only at the prices that equate supply and demand in all markets) and a "command system" when referring to those supply and demand decisions made by a centralized authority. Arrow (1969:69) refers to the perfectly competitive equilibrium as "a free market equilibrium." Such views would see the competitive conditions as necessary for the market process, where relative prices guide exchange behavior.

A second (and popular) view is not so concerned with the absence of collective action as long as it has no effect on the price system. This view is characterized by the attention placed on the price system in the market process. In fact, one is left with the impression that all that is necessary for a market process is a price system with some flexibility to respond to demand and supply conditions. Bell (1981:50) argues that this emphasis began in the writings of Alfred Marshall: "For Marshall, price theory was what economics was all about." Friedman (1976:5) proposes that: "The fundamental principle of the market sector is the use of purchase and sale to organize the use of resources." Further, he notes that: "The introduction of enterprises and money does not change the fundamental principle of a market system" (p. 6). In their book, The Market System, Haveman and Knopf (1966:11) state that: "A market system is one in which the basic economic questions are decided, not by some central authority, but by producers and consumers acting in response to prices. The essence of the system is that the goods are produced for exchange and exchanges are money transactions." While this definition reflects the operation of many modern U.S. markets, it excludes transactions that are accomplished in the absence of either money or explicit price systems.

Finally, the third view is the most restrictive in the sense that it presumes a price system and requires that the identities of trading parties do not affect the terms of the trade (Williamson 1979). Here, we have a distinction among three types of institutions for exchange: firms, markets, and relational contracting (Williamson 1985). Firms are characterized by formal, hierarchical organization governing resource owners and employers. Markets are characterized by discrete, anonymous transactions. Relational contracting is characterized by flexible,

time-dependent relationships between trading partners, as contained in implicit or explicit trading contracts.

One only has to contrast the last description with the category of a general exchange sphere to appreciate the lack of agreement on a single definition of the market. Further, the lack of agreement is not resolved when authors restrict themselves to discussing a single problem such as contracts. For example, Cheung (1983) argues that the market and the firm are merely different types of contracts. However, conflicting views emerge even in the course of coordinated dialogue. For example, in comments on a symposium paper, Holmstrom (1985) refers to non-market organization as transactions "conducted outside the price system, most notably within firms." According to this view, negotiation of employment contracts is not a market transaction. A few pages later, Riley (1985) describes how "a single individual on one side of the market negotiates with one or more individuals on the other side of the market." Certainly, this is the essence of employment negotiations in firms.

Having considered the salient features of the market process as used in economic theory and what attempts have been made to define it, we propose a general definition based upon the transaction level of exchange. Five overall requirements are important to this definition:

- (1) property rights defining control over goods and services; although private property may be important, its absence does not preclude a market process, whereas absence of control over goods and services does;
- (2) the desire to exchange;
- (3) transaction costs that do not exceed the perceived gains from completing the exchange;
- (4) choice over trading partners and/or choice over trading periods; and
- (5) trust in the security of the transaction being completed in an atmosphere of non-coercion.

A market process exists where these conditions are present for at least two or more traders.

The first requirement specifies that either private property or common property rights, or some hybrid, must be recognized, at least implicitly, between trading partners. Thus, stealing is not legitimate in a market process because this implies the absence of a shared definition of the rights that establish control over goods and services. The second condition reflects what Alchian and Allen (1969) call the exchange proposition; that some difference in personal tastes and/or endowments suggests the opportunity for traders to gain from an exchange. The third condition simply means that the exchange results in a net benefit to the parties after all costs are considered. The fourth requirement introduces the process of choice, thus, pure command or

traditional allocations involving no choice are not market processes. And finally, the fifth requirement rules out the use of violence in the market process.

Hence, we arrive at the definition of a free market. Such a market exists when uncoerced parties, desiring to exchange goods or services, may do so where the options are wider than to exchange or not to exchange.

2.3 MARKET STRUCTURES

While we have defined a market process which relies on the notion of choice over the transaction decision, the basic definition indicates nothing about the existence or extent of competition, government intervention, or allocation outcomes. Thus, our definition does not represent any particular organization of actual transactions. We have purposely made our definition general because we wish to explore to what extent alternative forms of organization lead to different trading outcomes.

What is lacking in our definition is information on the form of the market organization (Plott 1986). Market organization refers to the exchange institutions that govern or constrain the market process. Unless these institutions are specified, any number of allocation outcomes are possible from the market process. Conceptually at least, these outcomes become well-defined within the descriptive models of particular markets. Thus, our definition of a market process lacks realism without further specification of how it is constrained by social institutions. Brennan and Buchanan (1985:13) argue strongly that to understand the market, one must pay attention to the rules:

With respect to the far more important economic interaction among persons, however, the rules governing individual behavior within such interaction are often ignored. Economists, themselves, have been notoriously negligent in this respect. Complex analytic exercises on the workings of markets are often carried out without so much as passing reference to the rules within which individual behavior in those markets takes place. Adam Smith was not party to such neglect; he emphasized the importance of the "laws and institutions" of economic order.

Moreover, this attention to rules is valid even if we limit our interest to the workings of the popular notion of the free market, perceived by many to be the best example of an unconstrained market structure. Schotter (1985) argues that the popular notion of the free-market prescription for organizing economic activities, while very different from the perfectly competitive model of economic theory, is highly constrained by rules including: (a) preferences of the individual are the best guides to define value and welfare (Consumer Sovereignty); (b) people act in their own best interest (Utility Maximization and Profit Maximization); and (c) an unbridled price system provides the best incentives for economic growth (Laissez-faire).

As we argued above, the notion of the free market in the formal economics literature is related to the model of perfectly competitive exchange. The popular notion seems interested in rules promoting individual freedom to conduct commercial activities, thus, is more closely related to the idea of free enterprise. The perfectly competitive model deals solely with rules enabling price competition. As Stiglitz (1986:339) remarks:

It is now widely recognized that the nature of competition in market economies is far more complex (and more interesting) than the simple representation of price competition embodied in, say, the Arrow-Debreu model. Not only are there alternative objects of competition: firms compete not only about price but also about products and R&D. But, also, the structure of competition, the 'rules' which relate the pay-offs to each of the participants to the actions they undertake, may differ markedly from that envisioned in the standard model (original emphasis).

Whatever notion of the free market is used, the analysis of an actual market requires understanding the structure of rules that govern demand, supply, and transaction options for a particular set of transactions. We define this set of rules as an exchange structure, rather than a market structure, because not all possible exchanges of goods and services correspond to those described in our definition of the market. Where the exchange structure does fulfill the conditions of a market process it is also a market structure. Thus a market structure is an exchange structure, but the converse may not be true. The full set of exchange structures used to examine economic recovery from nuclear war are introduced in the chapter to follow.

2.4 CONCLUSION

From our review of the markets literature, we conclude that any application of the concept of the market process to an analysis of market behavior and allocation outcomes (whether to study the recovery question or other policy questions) must explicitly address the rules by which the market activities are organized. We define an exchange structure as the rules governing demand, supply, and transaction options for a particular set of transactions, and a market structure as an exchange structure that fulfills the conditions of the free market process.

The second important point is that the market, or more precisely, the market process, is a fundamental concept to many areas of economic research. Yet, we argue that it has not been rigorously defined. Although a rigorous definition exists in the perfectly competitive model, few economists would regard the model as representative of many of the market activities observed in the U.S. or other economies. We have developed a general definition of the market process which embodies a number of the more basic concepts suggested by the economics literature. These concepts include gains from trade, property rights, transactions costs, and some freedom of choice over the transaction in a

non-coercive environment. When combined with institutional rules, this general definition can be modified to reflect the conditions of ideal market structures or further refined to describe actual market activities.

3. EXCHANGE AND MARKET STRUCTURES AS RULES VECTORS

3.1 MODELING EXCHANGE AND MARKET STRUCTURES

In the last chapter, we argued that the free market exists where uncoerced parties, desiring to exchange goods or services, may do so where the options are wider than the simple choice to exchange or not. An appropriate level of abstraction at which to describe actual markets or exchange lies somewhere between this general definition and empirical descriptions of specific case studies. We propose an intermediate framework that generates a typology of non-market and market exchange structures. The most common typology of markets is based on the broad nature of goods or services traded, e.g., commodities, financial services, metals, etc. However, to ensure that our framework is properly bounded by the full range of logical possibilities, encompassing both formal and informal sectors of the economy, we have elected instead to base our typology on types of exchange structure.

The bounding variables for our framework of exchange structures are derived from literatures on both market and non-market exchange systems. The literature on formal markets already has reached a high level of abstraction, while the literature on non-market exchange tends to be strongly empirical, borrowing whatever abstract or explanatory concepts it uses from economic anthropology. However, a multivariate model that specifies the rules governing demand, supply and transaction options can be derived from both literatures. Finding the appropriate balance of abstraction and realism is often posed in the planning problems of large, complex systems (Katzner 1983).

The proposed model can be represented by a vector of rules constituting the exchange process. It goes beyond the traditional domain of economic market models, but as Friedman (1976:2) argues, such an approach is appropriate for the study of different types of economic organization:

Economics, by our definition, is not concerned with all economic problems. It is a social science, and is therefore concerned primarily with those economic problems whose solutions involve the cooperation and interaction of different individuals. It is concerned with problems involving a single individual only insofar as the individual's behavior has implications for or effect upon other individuals. Furthermore, it is concerned not with the economic problem in the abstract, but with how a particular society solves its economic problems. Formally, the economic problem is the same for a Robinson Crusoe economy, a backward agricultural economy, a modern industrial society organized on a communistic basis, and a modern industrial society organized on a capitalistic basis. But these different societies use different institutional arrangements to solve their economic problems. Thus there is need for a different economics - or a

different chapter in economics - for each kind of society. There turns out, in fact, to be much that is in common to the various chapters, but this cannot be required in advance; it is rather, one of the conclusions of economic science (original emphases).

Friedman's statement begs the question, how alike are exchange structures? Our framework is defined to be of sufficient generality to include exchanges in the financial, familial, or group membership spheres because the social phenomenon of exchange is common to all these activities. Yet, social science disciplines generally have distinguished different types of exchange, and then more or less restricted each disciplinary focus to a single type. As a result, economists have not said much about exchange for social membership, power, status, or prestige and anthropologists and sociologists have not said so much about exchange for financial gain. But as Smith (1974:320) notes, "Man's propensity to truck, barter, and exchange is but a special case of his propensity for social exchange in non-market and institutionally constrained market contexts."

Some of the disciplinary boundaries separating the social sciences have begun to dissolve, largely due to the growing body of interdisciplinary and extra-disciplinary research. Hirshleifer (1985:53) observes that as this work grows, it increases the strength of the evidence that, "There is only one social science." However, there remain two conceptual areas where the disciplinary interpretations continue to clash; rationality and reciprocity.

3.2 RATIONALITY

Rationality is a vast topic spanning mathematics, philosophy, and the social sciences. However, for the present purposes we confine ourselves to rationality in exchange behavior. In conventional microeconomics, rationality in exchange involves two major components; the basic motivation for action and the decision-making process by which actions are selected.

The first component, the motivation underlying exchange, refers to whether or not economic agents are motivated primarily by selfishness in their exchange behavior. Alternative motivations would be altruism and malevolence (i.e., the presence of intended maliciousness in actions). The underlying assumption for exchange motivation is not trivial since it bears directly upon the perceived gains from trade. Economists have preferred the selfishness assumption on the grounds that the other explanations can be made consistent with it by redefining what one means by gain. However, most often gains are still modeled as purely financial or material outcomes.

The second component of rationality in the economic literature refers to the process by which people select actions of exchange (Hirshleifer 1985:59):

Rationality is an instrumental concept. In the lights of one's goals (preferences), if the means chosen (actions) are appropriate the individual is rational; if not, irrational. "Appropriate" here refers to method rather than result. Rational behavior is action calculated on the basis of rules of logic and other norms of validity. Owing to chance, good method may not always lead to good result (original emphases).

While this definition is uncontentious, the way in which it has been applied in economic modeling suggests a much more narrow definition. This narrower concept underlies models where economic agents are assumed to maximize utility or profits over the set of all feasible actions. But as Simon (1955) has argued, this view of rationality ignores the burden it places on a person's ability to reason and use information. Thus, a more realistic assumption is that individuals intend to be rational but are limited in their abilities to do so (Simon 1961).

To help understand the implications of different assumptions about rationality, it is useful to distinguish between outcome and process rationality. Outcome rationality describes a calculated process of choice by individuals in the pursuit of explicit ends. Decisions can be fully described as if made by an individual decision maker, i.e., within an individualistic, self-interested perspective. Collective decision making entities, such as households or firms, are treated as if they too were individual decision makers.

To select among alternatives within an outcome rational framework, decisions are based almost entirely on the individuals' knowledge of market information. Individuals make their decisions without recourse to other individuals. In the event that decision makers encounter uncertainty, they tend to base their decisions on probabilistic estimates of the possible outcomes. Whatever else individuals may be thinking, their decisions will appear to be consistent with mathematical optimization over the choice set. Finally, the factors influencing individual behavior can be reduced to a set of single decision points, each of whose influences can be considered as a separate entity.

There are central advantages to economics in the concept of outcome rationality, despite its admittedly simple assumptions about social behavior. Because of the emphasis on the representative individual, it is not necessary to describe fully the social system within which individuals behave. This facilitates the development of models that designate the degree, location, scheduling, and kind of interventions possible in various economic systems. It also allows for the construction of mathematically elegant models whose predictive value can be determined easily.

The limitation of outcome rationality revolves around its inability to explain confounding phenomena embedded in the surrounding social and cultural context of decision making. Conventional microeconomic theory has relied on a sharp distinction among ends, alternatives, and decision techniques in choosing among alternatives, but choice is permitted only about alternatives, not about ends or techniques. Yet, as Leibenstein

(1976) points out, decision techniques may well be treated as legitimate variables without any loss of coherence to economic analysis but, rather, resulting in models that better reflect real world decision making.

The assumption of process rationality is broader in scope than outcome rationality because the total social milieu of the individual is considered. Additionally, its focus includes the knowledge required by individuals in order for them to function in social systems that either promote or affect patterns of behavior. Studying the knowledge that these individuals have of social institutions, obligations, etc., thus becomes the point of departure relative to the outcome rational models.

Description of the decision behavior under the assumption of process rationality often requires a holistic framework. In this framework, elements tend to take on important attributes, or meaning, in relationship to all other elements being studied. Holism acknowledges that structured hierarchies of decision points must be hypothesized from a study of the relationship among elements. In other words, there must be explicit recognition that decisions are linked by more than just the passing of time.

The assumption of process rationality is applicable where economic agents may not have the freedom to choose over all the feasible actions where traditional rules apply. In fact, discrete exchanges may take place which are completely dictated by traditional rules of fixed allocations. This would be true where the individual has relinquished freedom of choice for group membership. While the more aggregate action still involves choice, i.e., to belong or not, at the transaction level, choice over alternative options is no longer available.

Finally, many examples once perceived as irrational behavior in outcome rational frameworks are now being explained as responses to high transaction costs. In fact, transaction cost analysis provides the link that can reconcile the outcome and process rational views. For example McClosky (1986) shows that historically, English farmers scattered their holdings of farmland not because they were irrational, but because insufficient markets existed in the farmers' social environment for spreading risk. Transaction cost analysis has also been used to investigate the creation of firms (Coase 1937), vertical integration (Williamson 1975), issuing coupons that lower prices in repeat transactions (Cremer 1984) as well as numerous other issues.

As the transaction-cost literature demonstrates, many of the problems raised by the outcome/process rationality debate can be resolved by focusing on the incentives facing economic agents rather than solely focusing on the behavioral motivations. Incentives are a combination of the various payoffs traders will receive depending on their choice of actions and the underlying individual motivations. As Sahlins (1972) and others argue, a more complete understanding of exchange incentives requires that we pay careful attention to the phenomenon of reciprocity.

3.3 RECIPROCITY

Sahlins (1972) defines three levels of reciprocal exchange. Positive reciprocity exists where the trader provides a socially recognized higher value of goods than he receives. Negative reciprocity exists when the trader attempts to maximize his return regardless of any socially recognized limits, "the attempt to get something for nothing with impunity." Reciprocity is balanced where the value of goods exchanged is recognized as roughly equivalent by both trading partners and other potential market participants. The traditional economic model of exchange has focused largely on balanced reciprocity where payment is made at the time of the transaction. However, in actual transactions, we observe variation in the timing of payment (Faith and Tollison 1980) and in the timing of price determination (Smith and Smith 1985). The empirical evidence makes it difficult to deny the presence of other types of reciprocity in actual economies.

Certainly from a social-cost perspective, negative reciprocity underlies the notion of monopoly rents or violation of property rights. Positive reciprocity, although often regarded as a misinterpretation (Becker 1976), remains a nagging attribute of many exchange activities. Rather than attempt to explain away the phenomenon of positive reciprocity, we find it fits very well into our exchange framework when we allow for the exchange incentives associated with social bonding, prestige and trust. Positive reciprocity creates a running debt balance (Mauss 1925, Davis 1972) between traders that provides the incentive for continued interactions and the display of good faith. The non-market and market literatures can be reconciled by simple recognition of this principle. And as Hirshleifer (1985:58) observes, the principle is quite universal: "Some willingness to forego selfish advantage, some element of genuine trust between trading partners or among business associates, almost always remains a necessity in the world of affairs."

It has been noted (Sahlins 1972, Lomnitz 1971) that the nature of reciprocity varies with the social distance between suppliers such that positive reciprocity occurs among family, kin, and close friends constituting a close-knit network (Bott 1957) that can be measured according to a range of network-theoretic variables (Holland and Leinhardt 1979, Gross and Rayner 1985). The goods most frequently exchanged in such structures are labor services, especially rudimentary specific skills, and commodities produced by group members with common skills, but at different times.

On the other hand, exchange in a monopolistic market structure is not characterized by close-knit networks, but is assumed to take place between non-intimates, unconstrained by rules arising from social proximity. Whereas the purpose of exchange between intimates with similar endowments is the creation and maintenance of social bonds by a continuing balance of debt, the incentive for a monopolist to exchange is maximization of income and unregulated accumulation of personal wealth and prestige.

Our framework overcomes a major shortcoming of many economic models of non-market exchange by explicitly recognizing reciprocity, the

transaction costs people face when making exchange decisions, and restrictions on choice. We allow for distinctions in the incentives to exchange and for distinctions in the allocation rules. Thus, we do not simply redefine all goals as self-interested and all choice among alternatives as outcome rational, as have many studies employing a higher level of analytical abstraction (Hirshleifer 1985). In our study, we are interested especially in the information on network formation and social membership, therefore, we must not explain it away.

3.4 A FRAMEWORK OF EXCHANGE STRUCTURES

Although the activities of informal markets might be considered an unaccounted part of the formal economy, there are major differences in the rules governing their operation. Despite their size, mainstream economics only recently has begun serious consideration of informal markets. The absence of these kinds of transactions from the formal market arena, if noticed at all, has been viewed simply as extra-market activity. Sociologists and anthropologists, to whom study of these markets has been left, have seldom brought mainstream economic perspectives to bear on this topic. Generally, they have preferred to assert that informal markets are not susceptible to elucidation through economic concepts because they exist not primarily for economic gain, but for social bonding and prestige.

Our model is an attempt to bring both informal and formal markets into a single explanatory framework through the notion that the primary goods sought in the informal sector are prestige and social bonding, mediated through exchange of commodities and services. Furthermore, traders, who normally operate in formal markets, may participate in order to reduce transaction costs, obtain goods below formal market prices, and obtain illicit goods. In this respect, it is clear that informal and formal markets exist in an environment of interdependence (Henry 1987). Thus, they differ from primitive markets, that also promote social bonding and prestige, in that the latter may be quite self-sufficient.

We argue that all exchange can be modeled as a combination of rules constituting an exchange structure or what Smith (1986) calls a microeconomic institution. Microeconomic systems emerge from the interaction of a set of traders and a set of rights and obligations (the microeconomic institution). The set of traders is comprised of economic agents, their resource endowments, and their knowledge endowments. The set of rights and obligations specifies the rights of agents to communicate in order to affect exchange, property rights, allocation rules, and cost-imputation rules. Thus, an institution may be seen as a set of rules that indicate the agents and options allowed in any transaction. A market is present where the rules enable the conditions for a market process to be fulfilled, otherwise, the institution is a non-market exchange structure.

3.5 RULES AND EXCHANGE STRUCTURES

Each exchange structure consists of a series of underlying rules constituting demand, supply, and transaction options. Before we can list the actual rules for each exchange structure, we must consider the concept of rules. For example, is there a difference between the explicit, normative rules expressed by the traders (participant rules) and the implicit rules (observer rules) that an analyst might use to describe the transactions he/she observes? If the participants' rules and the observers' rules differ, which do we choose to construct our vector, or is there some way to combine them?

The rules that enable a market to exist are described as constitutive rules. These are rules, such as the rules governing the movement of chess pieces, that compose human activities. Without these rules the activity, in this case a chess game, could not be said to exist. There may be other rules about how to do the activity well, for example, develop knights before bishops; but these are not essential to the game. These other rules, therefore, are not said to be constitutive but facilitative.

Constitutive rules may be prescriptive or descriptive. A prescriptive rule, such as "Thou shalt not kill," requires that the subject of the rule voluntarily behave in a certain fashion, to choose to commit or refrain from an act, as a condition of participating in the wider social activity. Refraining from murder (however homicide is defined locally) is a condition of participating as a full member of any society. Of course, voluntary adherence to prescriptive rules is usually encouraged by the threat of sanctions, most dramatically by exclusion from the wider society, more often by the imposition of deprivations. Chess players will not accept challenges from those who cheat or persistently refuse to learn the permissible moves. Serious offenders against social codes may be excluded from the enjoyment of civil society or subjected to a curtailment of liberty, depending on the nature and severity of their offense.

A descriptive rule is not necessarily a constraint on voluntary behavior, but an account of regularities in behavior irrespective of whether it is voluntary, habitual, or entirely determined by forces that are beyond the subject's control. Natural laws are invariably descriptive. Planetary motion is not regular because the burdensome laws of Kepler prevent planets from behaving as they would otherwise choose. Natural laws, therefore, consist of descriptive rules that are invariably empirical. That is, they are derived by inference from observation.

The social and economic rules that constitute human societies may be of two kinds. There are empirical rules that describe how people behave (descriptive). These are derived by observation of, but not necessarily known to, or expressed by, the subjects. There are also normative rules that represent rule makers' conscious model of how a society's members ought to conduct themselves (prescriptive). Study of empirical rules often teaches us that the normative rules are more honored in the breach than the observance, in which case we usually

reconstruct empirical rules to describe the patterns of exceptions to the normative rules that may be permitted (Edgerton 1985).

In examining markets, and deriving the rules vectors that constitute market behavior we are interested primarily in the empirical, descriptive rules. In addition, the normative, prescriptive rules are of interest insofar as they actually constrain or enable choice behavior and so coincide with a descriptive rule of that behavior. Such cases would indicate the presence of an exchange structure but may not satisfy our criteria for a market structure. Finally, our criterion of sustainability requires that we also examine normative, facilitating rules that enable market structures to function efficiently, in an economic sense, and fairly, in a sense understood by the participants.

The complete series of rules for each market or exchange structure is termed the rules vector for that structure. Appendix A contains the generic rules vector that we applied to each exchange structure. It consists of three types of rules: demand rules, supply rules and transaction-options rules.

The demand rules regulate the types of traders that can legitimately signal their intentions to obtain the good or service. Demand rules describe who may demand the good or service and how it will be consumed, e.g., whether or not it will be shared within a consuming unit. Another demand rule specifies whether or not the purchase represents a significant portion of the consumer's income, i.e., indivisibility in consumption, since this will indicate sampling or market-entry problems. Finally, we consider whether or not demand is for survival or status because this will affect the urgency of the demand.

The supply rules not only focus on who may supply the good or service, but also how the technology and inputs of production might imply particular supply conditions. Who may supply may be limited by either command rules, e.g., formal licensing, or traditional rules, e.g., where only the son of a blacksmith may become a blacksmith. The inputs may affect the temporal or geographical conditions of supply, in other words, they may place limitations on when or where supply may be available. The production technology or physical characteristics of the good may affect the storage potential of the product. Descriptive supply rules may imply limitations on how supply can be organized. For example, a natural constraint on the only source of a good or a crucial input to its production provides a condition favoring a monopolist in supply. Additionally, there may be technological reasons such that production is less costly at large levels of output, i.e., there may be economies of scale. Economies of scale are similar to indivisibility in consumption in that the presence of either condition implies a barrier to entry in the market by certain suppliers or consumers. In the presence of economies of scale, producers must be of a sufficient size to produce the good or service competitively. In the presence of indivisibility in consumption, buyers must have a sufficient level of resources to purchase the good or service.

Two other supply conditions that may affect the rules governing the organization of supply are the major uncertainties facing suppliers and whether or not supply is homogeneous or differentiated. In the first case, supply uncertainties can act much in the same way as natural or technical constraints on supply. This is especially true where there is significant informational uncertainty making risk an important cost of supply. In the case of product differentiation, greater distinctions among products that fulfill similar demands may encourage greater rivalry as firms attempt to increase their individual market shares.

Many of the rules and conditions revealed in the demand and supply analysis underlie specific rules that govern transaction options. Transaction options are those choices over property rights, selling, purchasing, pricing, monitoring, enforcement, and information that are permissible in the recognized transactions for the good or service.

Rules that designate property rights include specification of who holds the title to the property, who holds the entitlement to use and manage the property, who receives the costs and benefits associated with the use of the property. Exclusivity exists where all costs and benefits of owning and using the property accrue to the owner. Transferability exists where all property rights are transferable in a voluntary exchange. Finally, enforceability exists where property rights are secure from involuntary seizure or encroachment by others.

The selling and purchasing rules include specification of how, where, and when these activities may take place. For example, traditional business hours are, in effect, rules affecting when a consumer may make an offer to buy from the supplier. Rules regarding pricing can stipulate that prices are posted, i.e. fixed at least for the transaction, established through an auction or negotiation process decided prior to the consumption of a good, or decided after consumption. Additionally, rules may exist that limit the medium of exchange to be used to complete a transaction. This is particularly true for certain prestige goods that can only be traded for other prestige items.

Finally, transaction options may be limited by how transactions are legitimated and enforced. For example, regulation, laws, and customs may limit the legitimacy of exchanges that traders might otherwise desire to transact. Another limitation on the transaction options arises from how information is distributed in the exchange structure. For example, transaction costs will be generally higher for traders where buyers and sellers do not have access to the same information regarding the good or service. Finally, there may be externalities present in the production or consumption of the good or service. These externalities may instigate additional rules to allocate the costs and/or benefits of the externalities to particular economic agents. For example, regulation may be enforced to limit the amount of supply that can be produced by a seller who uses a technology that causes pollution.

3.6 SOURCES OF EVIDENCE FOR THE RULES VECTORS AND EXCHANGE STRUCTURES

Specification of the rules for non-market and market exchange is based on existing evidence from three fields of study. These fields include the literatures relating to the formal markets in economic theory, informal economic activity in sociology, and primitive markets and trading in undeveloped settings from anthropology where maintenance of civil order and the enforcement of contracts is, or was, uncertain or based on very different arrangements from those prevailing in the U.S. today.

Economic theory has focused on the activities that transpire in formal market structures. Here, the term, formal market, is used to denote the commercial exchange structures found in the U.S. economy, where buyers and sellers exchange goods and services for money. At the most basic level of inquiry, it is recognized that formal markets perform certain functions that facilitate their continuity or allow the operation of other markets. For example, formal markets serve to disseminate information to economic agents, signal opportunities to buyers and sellers, reduce transaction costs for intertemporal or interregional exchanges, and exploit comparative advantage, specialization, and the division of labor. Of particular interest in the study of formal markets is the analysis of market power, uncertainty, and externalities, i.e., those forces that would prevent a market from satisfying the conditions of pure competition.

At a more disaggregated level, formal-market analysis examines questions regarding the conditions of exchange between economic agents. For example, frameworks that are concerned with decentralized exchange, medium of exchange, and contracting between agents have obvious implications for post-disaster recovery. Among the useful insights emerging from the formal-market frameworks are the concepts of auctioneers, middlemen, entrepreneurs, coalition formation, and bidding behavior. Further, these frameworks highlight the importance of coordinating wants in the presence of barter exchange, the efficacy of money when goods are complex and/or involve large coalitions of traders, and the gains expected from the introduction of money. Lastly, formal-market analyses identify various problems involved in the negotiation, maintenance, and enforcement of contracts where asymmetric information and market power pose impediments to trade.

In speculating on a sudden cataclysmic destruction or impairment of existing societal institutions, insight may be gained from examining how groups transacting in the informal sector of the economy have overcome problems similar to the hypothesized economic-recovery problems. Of particular interest is how these groups have developed community-based, informal institutions to substitute for the institutions found in the formal sector.

A number of neighborhoods populated by individuals excluded from formal markets have developed trading and exchange systems for goods and services employing a variety of skills (Whyte 1955, Liebow 1968, Dow 1977). While some of these exchange are criminal, many are not. They involve household production (Burns 1977, Pahl and Wallace 1984),

employment of neighbors and friends, and the use of unlicensed craftsmen and unregistered business, forming an irregular or informal economy on the fringes of the formal-market sector (Ferman and Berndt 1981).

Informal economies develop a strong knowledge base that forms neighborhood learning webs and informal exchanges of skills (Ferman 1968, Ward 1981). Studies of low-income neighborhoods also show that such trading networks serve to integrate the community and provide a social fabric of mutual aid and support (Lowenthal 1975). Other studies show that it is not only the poor that trade in informal-exchange structures. Many employed professionals and craftsmen engage in informal work (Pahl 1984). Finally, disillusionment with the established helping services and decline in the traditional systems of social support, such as the family, has led to an expansion of non-market exchange structures that promote self-help and mutual-aid among group members (Katz and Bender 1976, Robinson and Henry 1977).

Evidence from the trading relationships exhibited by primitive economies can be superimposed on contemporary informal-economy studies in order to suggest the rules likely to exist where both institutions and resources are heavily damaged. The primitive-economy relationships often depend on the protection of traders by powerful patrons or blood brothers (Eisenstadt and Roniger 1984). Studies of primitive rationing suggest that it does not depend on centralized authority (Douglas 1958). Studies of the symbolic aspects of exchange and their relationship to the development of mechanisms of prestige and power, and the formation of political alliances (Pospisil 1963, Strathern 1971), may be important in any context where existing authority structures are destroyed or severely impaired.

The economic-theory, informal-economies, and primitive-trading fields of study not only suggest alternative exchange rules that should be considered but also define three interdependent spheres of non-command exchange structures: traditional, informal, and formal. Figure 1 shows these spheres and the specific exchange structures that are discussed by each field of study and used for the analysis of each recovery scenario. However, given our focus on market activities, we collapse the three spheres into two categories of exchange structures: non-market and market.

3.7 CONCLUSION

We have developed an analytical framework to explore the economic-recovery question under different survival scenarios. A positive feature of this framework is that it is not restricted to transactions that are strictly market oriented, rather, it is derived from the more general conditions of exchange activities. As a result, the framework extends beyond the notion that exchange is conducted solely for financial gain under the conditions of balanced reciprocity and considers incentives such as social bonding, status, and prestige. We can use the framework to ask about the relationship between the general exchange conditions and the market process for a particular set of transactions.

The use of the rules vector to characterize exchange structures facilitates this kind of analysis because it disaggregates an exchange institution into its rule components and thus, allows a comparison to be made across institutional types. The rules-vector approach also allows us to think about how particular rules may be changed within the institution rather than the complete substitution of one institution for another. Additionally, we may reflect on the applicability of particular rules vectors in the presence of the different levels of survival for institutions and resources by examining the compatibility of particular rules with these survival levels. Once identified, feasible rules vectors will constitute some of the possible ways in which the necessary and facilitating functions could be fulfilled under the different scenario descriptions discussed in chapters six through nine.

<u>TRADITIONAL SPHERE</u>	<u>INFORMAL SPHERE</u>
Subsistence	Intimate
Prestige	Associational
<u>FORMAL SPHERE</u>	
Peasant marketplace	Criminal
Perfect competition	
Imperfect competition	
Oligopoly/oligopsony	
Monopoly/monopsony	
Bilateral monopoly	

Figure 1. Non-command exchange structures in different spheres of exchange

4. NON-MARKET EXCHANGE STRUCTURES

This chapter follows the general shape of the rules vectors specified in Appendices A and B to describe three exchange structures that are characterized by traditional rules of fixed allocation. Two of these exchange structures are derived from economic anthropology while the third is taken from sociological accounts of hidden-economy and self-help activity in contemporary industrial society.

We begin with the structures derived from economic anthropology, where our reading of the anthropological record yields two types of fixed-allocation exchange that can be rendered as rules vectors. These are the subsistence and prestige exchanges of primitive economies.

4.1 SUBSISTENCE EXCHANGE

The subsistence exchange structure consists of small coresidential groups that are both producers and consumers of the goods and services that circulate in the system. Such groups may be families, households, clans, manors, etc., usually consisting of coresident extended kin (Nash 1961). It often is the case that the group will not have a large pool from which to draw members, resulting in a high level of interrelatedness. The goods that they exchange tend to be non-durable, mainly foodstuffs, representing almost their entire income (Dalton 1964). Services in subsistence groups usually consist of reciprocal exchanges of labor power for shelter construction or food production.

Subsistence economies usually are regarded as exhibiting very infrequent exchange. Certainly this is true of trade between groups. Where such trade does exist, it takes the form of direct barter in peripheral markets where small quantities of produce are exchanged in face-to-face transactions. The goods in such markets consist wholly of incidental or serendipitous surpluses that occur when producers perceive that they have exceeded their subsistence needs. Hence, the prices of goods in these peripheral markets do not stimulate increased production.

Demand for goods produced outside of the subsistence group is very uncommon, and only likely in cases of extreme need for commodities that are unavailable internally (Forde and Douglas 1956). Such goods are likely to be traditionally known commodities, and a bid to buy will be made as a bid to supply. Such offers to supply are made by open display at a customary point of exchange, such as a roadside stall or a silent trade post.

Silent trade occurs when exchange partners neither meet face-to-face nor through an intermediary (Montandon 1934), for example, agriculturalists leave produce at a customary location for fishermen from another tribe to take and leave fish in exchange (Quiggin 1949). Such exchanges may be indicative of a low level of trust between partners, particularly fears for physical safety. However, even in

silent trade, the expectation of future repetitions of exchanges reinforces transactions between groups. Even so, information remains restricted between groups and, since it can be costly to collect, asymmetries may persist over time.

It is important to distinguish these relatively uncommon trading exchanges from the daily incidence of marketless exchange that takes place within the subsistence group in accordance with continuous social obligations that are defined by custom.

Consumption of subsistence items is shared according to fixed customary rules of allocation such as those which require certain cuts of meat to be given to specific relatives of the hunter, or those which stipulate who may expect to eat at a particular woman's cooking fire. In addition to promoting group interreliance, and reminding members of their kinship, these sharing rules reduce risk by assuring continuous supplies of scarcer foodstuffs, especially meat or fish (Forde and Douglas 1956).

Demand for subsistence goods is constant and signaled through the production/consumption group. Since reciprocity is usually delayed, a bid to buy may look simply like a demand for supply, that is to say that goods will be offered with the expectation of a return. Bids to buy or, more accurately, to consume are made when the buyer has insufficient supply of his own and other producer/consumers have surplus. For goods and services that are common property, bids to share in consumption are made on the basis of availability. Offers to sell or, more accurately, to supply, are made usually without expectation of immediate return.

Suppliers are the same individuals as demanders within the production/consumption groups of subsistence exchange structures. However, fixed rules for allocation of particular goods to particular persons may restrict supply according to kinship or the sexual division of labor. Supplier restrictions may be very few and simple, such as the Bushman exclusion of women from hunting (Lee 1968). More complex rules may stipulate a hierarchy of suppliers and demanders based on obligations of gender, age, or kinship relationship.

The subsistence structure also is characterized by simple technology for production and storage. Supply is restricted by the boundaries of the production/consumption unit, and its geographical range (Nash 1964) while storage is limited to smoked, dried, and salted products, nuts and grains, and to live storage "on the hoof" providing blood and milk for immediate use and long-term storage of meat. There may be continual availability of certain agricultural and pastoral products, however, supplies of fish and game may be erratic (Forde and Douglas 1959). Among hunter-gatherers production is for the satisfaction of daily needs (Lee 1969). More technologically complex societies may produce for seasonal or annual but, nonetheless, immediate needs.

The principal technical constraints on subsistence supply are a low level of technological development, simplicity of tools, and lack of applied science in production techniques (Nash 1964). Institutional

constraints are a relatively simple division of labor, difficulty in coordinating labor for large projects, such as clearing forest for agriculture or hunting large game, and the internal distributive rules that constrain supply to individuals while guaranteeing minimum availability to all group members. Seasonal variation in availability of plant and animal species is a major constraint in many areas, as well as a source of uncertainty. Also, predatory raiding by other human groups or animal species may upset supply.

Property rights in subsistence exchange structures may be quite varied. However, apart from very few simple personal items, major productive resources, i.e., land and game, are likely to be either open access, as in the case of hunter-gatherers, or common property (mediated perhaps through the person of a leader or chief) as in feudalism. Where there is open access to resources, property rules do not apply since entitlements to use and manage are not defined effectively. Whereas the title to crops, livestock, etc. usually is held by leaders of households, usufruct, i.e., the customary right of use, commonly applies to all members of the household group whose leader is recognized as the legitimate manager of the resource, in many cases, usufruct may be enlarged to include extended kin.

Transferability of property rights seldom applies to goods or services in subsistence exchange structures. This is because members of these societies are inextricably linked together in a continuing web of obligation and counter obligation. Therefore, a resource manager may not be able to alienate property that is held (explicitly or implicitly) on behalf of a household or kinship group. In a sense, all members of the group may hold a lien on property, and transfer of title may only be made legitimately by consensus of the stakeholders. Legitimation of exchange is by adherence to customary rules of distribution within the production/consumption group, and by repeated exchange with the same partners outside of the group.

Property rights are enforced, usually through pressure from the kinship network in the form of argument, shaming, and ostracism. It is not possible to separate extra-market legal constraints from endogenous exchange-enforcement mechanisms in subsistence economies, since exchange of goods and services is synonymous with social intercourse. However, in subsistence exchange, very few goods will be durable property, therefore, although enforceability holds for property, not many resources will be expended to enforce this rule.

There is no general medium of exchange in the subsistence exchange structure, nor is an independent measure of value used. Indeed, no systematic tally is kept of goods exchanged routinely within the group. Transactions are enforced by the group through shame, ridicule and ostracism.

Within the production/consumption group, information is symmetrical and free, since privacy of information is very limited. Where recognized as such, externalities may be the subject of negotiation between parties to a transaction. More usually, externalities are inherent in exchanges and may be the ultimate motivation for the

exchange. In other words, exchange rules may be promoted by the group because they produce positive externalities for the whole, regardless of whether these rules would be selected by the individual traders. For example, sharing rules for game may not produce a net benefit for a consumer who would otherwise prefer to build credit only with the better hunters in the group. However, the externality of social cohesion provided by repeated delayed exchange may be even more important for overall survival of the group than the provision of that credit to an individual. Further, the use of fixed allocation rules may benefit the group by limiting externalities arising from individuals haggling over distribution of resources. Whilst haggling is more consistent with individual choice, it may be wasteful of resources when survival is a primary objective.

However, it is not the case that subsistence exchange systems necessarily operate at the level of marginal survival. It is important to avoid a common ethnocentric bias that equates technological and dietary simplicity with perpetual shortage and hardship. Sahlins (1972:9) describes how the Kalahari Bushmen and the Yahgan of Tierra del Fuego enjoy "'a kind of material plenty," at least in the realm of everyday useful things, apart from food and water.' They achieve this affluence by restricting wants to a limited range of resources that are plentiful in their environment and limiting the accumulation of possessions to those that can be carried on their persons. Such limitations on wants are by no means unique to exotic or technologically simple societies. Dennis, Henriques, and Slaughter (1969) describe various methods of income leveling and restraints on conspicuous consumption among West Yorkshire coal miners in order to maintain the cohesion of the community. Societies like the Yorkshire miners and Kalahari Bushmen are the very antithesis of those that commit extensive resources to the second type of non-market exchange, prestige exchange.

4.2 PRESTIGE EXCHANGE

The prestige sphere consists of the ritual transfer of certain restricted items, held in high esteem by the participants in the exchange. These items are almost invariably storable, and are restricted, by convention, from being exchanged for subsistence type goods (Bohannan 1959). They may, however, constitute required payments for very important services such as bridewealth payments, homicide compensation, religious and medical fees, dispute-adjudication fees, etc (Douglas 1958).

Harold Schneider (1974) disputes the separation of prestige and subsistence goods, pointing out that Africans frequently use cattle in both ways. However, the use, in some cases, of the same commodity in both spheres of economic life does not vitiate the distinction between prestige and subsistence exchange structures. The meaning that people attach to a cow as they milk it may be quite different from that which they experience when they proudly display it before their peers.

Another important aspect of prestige exchange is that transactions frequently are characterized by delayed reciprocity, so that transfers

of the goods and the return payment are not simultaneous. As Mauss (1925) points out, an alternating balance of running debt is a powerful way of promoting social bonds that ensure the continuation of a relationship that is instituted by the choice of a trading partner. The prestige sphere is often overtly competitive, as trading partners attempt to bankrupt one another by continuously increasing the scale of return payments that place the recipient in debt (Strathern 1971). Hence, the prestige exchange structure represents a hybrid of traditional fixed allocations, often involving fixed scales of equivalent values rather than prices, as well as features of true market systems, such as choice of exchange partner and negotiated prices. However, the primary object of such activities is not simply financial gain, but prestige through the creation and maintenance of social bonds.

The prestige structure is especially relevant to our present study in that it represents the earliest manifestations of credit and of a single-medium of payment for multiple goods and services (Mauss 1925). The operation of primitive systems of credit and close substitutes for money, in the absence of centralized guarantors, may hold important lessons for the resource abundance and worst case scenarios for post-disaster recovery.

Prestige exchange also may play an important role in establishing networks for long-range trade. The exchange of non-prestige gimwali goods that accompanies the transfer of prestige enhancing kula shells is one such case reported in the Trobriand Islands (Malinowski 1922). In this example, Trobrianders making hazardous ocean voyages, ostensibly to discharge prestige obligations, use the opportunity to engage in trade of items of everyday use.

Demands for prestige goods or services may be made by individuals who are recognized in the community as being of comparable moral worth to the supplier and having the resources to make a future return. Demanders must be of near equivalent status to suppliers in a formal or informal hierarchy that may be based on wealth, kinship, or office.

Demanders usually will have a following based on kinship (Codere 1950), coresidence, or personal contract (Strathern 1971). Consumption is shared within this following according to the determination of the demander, sometimes constrained by custom (Douglas 1958), and in accordance with his own outstanding obligations to creditors both inside and outside the following.

Since demand for prestige goods is for status, large balances of debt are maintained between prestations, i.e., customary offerings, based on delayed reciprocity (Strathern 1971). Prestige goods may be both divisible and indivisible, largely dependent on the level of the exchange. However, there is a strong tendency for large major prestations to be lumpy. As participants in the system pursue greater levels of prestige, the exchanges become increasingly lumpy, exposing the trader to escalating levels of risk. At very high levels, the exchange rules become very inflexible, reflecting the specificity of the exchange.

The actual number of cattle or pigs offered may be crucial, so that the whole lot cannot be regarded as divisible. Such lots may be portioned into smaller lots or combined, subsequent to the exchange, to pay off outstanding creditors, or for distribution to kin for safekeeping, as is often the case with livestock. Prestige goods may be homogeneous, as with livestock, or heterogeneous, as with the copper plates exchanged by the Kwakiutl in their potlatches. These coppers derive their value from their particular histories of past ownership by prominent individuals.

Prestige goods also are storable, either as durable items, e.g., shells in Trobriand kula exchange (Malinowski 1922, Singh Uberoi 1962), blankets and coppers in Kwakiutl potlatch (Codere 1950), iron rods among the Tiv of central Nigeria (Bohannan 1959), or as livestock in Papua New Guinea (Strathern 1971) and Africa (Evans-Pritchard 1940). Storability increases prestige through extended control over resource consumption.

Demanders are also suppliers within the networks linking kinship/local groups to prominent individuals and linking groups to one another through such individuals. Supply occurs when sufficient surplus is accumulated to pay off a major creditor and increase the scale of debt. Technical constraints on prestige supply arise from timing the availability of goods provided to the supplier by his own creditors to coincide with demand. Institutional constraints include obligations to supply other partners before one who may be making loud demands, and the strict specification of the types of goods obligated for particular kinds of transaction. Natural constraints include scarcity of prestige goods, breeding cycles of prestige livestock, and weather, especially in the case of long-distance exchanges such as the Trobrianders' kula. Major uncertainties facing suppliers include coordination of assembly of goods at the time appropriate for a prestation and, in the case of delayed reciprocity, doubt about the ability of a recipient to reciprocate in the future.

The title to property in the prestige exchange structure is held by the demanders/suppliers at the head of kin or local groups, who also are entitled to use and manage it. Livestock may be distributed among kin and followers for care and breeding. Use of byproducts (blood, milk, and dung) may belong to the stockkeeper, but not the flesh or title. However, exclusivity does not apply because status is achieved by conspicuous consumption or display of goods. Prestations usually will be accompanied by public feasting, dancing and celebration. The title to actual goods exchanged may belong to a group leader, but their benefits in prestige and use will be shared by the group as a whole. Some of the costs of putting a prestation together may fall on followers who do not receive direct benefits or explicit compensation.

The transferability of property rights may apply, as with the Kwakiutl who are able to destroy copper plates and other valuables in demonstrations of conspicuous consumption (Codere 1950). In other contexts not all rights are transferable. For example, many kinship systems reserve some rights of a lineage over its daughters who are exchanged in marriage, even where bride price is paid.

Residual property rights may persist after the title is transferred, especially when the exchange is based on delayed reciprocity. Failure of a recipient of the title to perform some future obligation may cause the title to revert to the original owner, who may also be entitled to compensation for incidental losses from its use by another. For example, a herder reclaiming cattle from an unfulfilled marriage contract might be entitled also to claim calves that would have been his had he not transferred the beast to another (Evans-Pritchard 1951).

The enforceability of contracts is maintained through repeated transactions, and the social sanctions of shaming, ostracism, and exclusion from the prestige exchange sphere. As with subsistence economies, it is not possible to separate the extra-market enforcement mechanisms from the exchange activity, all the more so since the principal purpose of prestige exchange is the creation and maintenance of social relations through an exchange idiom.

Bids to buy are made within the kinship or local group, or within the wider circle of group leaders who have established customary patterns of exchange. The timing of bids to buy depends upon the buyer, knowing that the seller has resources and sufficient time has elapsed since the buyer made an appropriate prestation to the current seller. Also, the buyer may seek to call in debts when pressed by his own creditors.

Bids to buy are made through hints and complaints recalling previous prestations from the present consumer to the present potential supplier. Recollection of existing lineage debts from previous generations may be important in bids to obtain wives. Of course, as previously observed, not all debtors are equal.

Offers to supply may be made to a particular creditor without necessarily an expectation of immediate reciprocity. Once again, not all creditors are equal. The supplier will attempt to give priority to exchange partners with marginally higher status than his own. The timing of offers to supply are chiefly dependent on resource availability and the time elapsed since receiving a prestation from the current demander. Timing may be affected, as among the Kwakiutl, also by the need to save face, or regain status lost as a result of some independent humiliation (Codere 1950).

The media of exchange are a limited range of customarily recognized prestige goods. These include (in various places) women, cattle, pigs, shells, iron rods, raffia cloth, coppers, etc. Some of these commodities may become close substitutes for money in the prestige sphere and are used for bridewealth and mortuary payments, initiation fees to various cults, homicide compensation, court fees for dispute settlement, etc. However, subsistence goods are not accepted in exchange for prestige goods in any quantities, except in exceptional circumstances defined by ritual obligation or extreme emergency need (Douglas 1958, Bohannan 1959). Pricing in prestige spheres is almost invariably according to convention or arrived at through haggling around conventional norms or ideals.

Just as transactions are legitimated through feasting or other public celebration, usually involving conspicuous display or consumption, they are enforced through shaming. Defaulters may be "rubbished" or excluded from future transactions with any partner (Strathern 1971). Legalistic sanctions also may be applied, but these seldom are entirely separate, given the multicentric exchange structure.

Participants in prestige exchange try to restrict accurate information about their resources in order to defer the demands of creditors. However, this usually is difficult in small-scale societies. As in the fine-art market and the desirability of acquiring English stately homes, information about the good, demander, and supplier is an integral part of the prestige exchange structure. This is due to the fact that prestige exchanges are characterized by general display.

Where information costs are low, it is likely that the history of the good, its past owners, and its new owner will affect the level of prestige that is attached to the trading of the good. An English home that is known to have been occupied by an historical personage or family derives value from the personal prestige of its former owners. A work of art that has been displayed in several major museums is likely to sell for more than a technically comparable piece by the same artist that has remained in obscure ownership for many years. In such cases, prices for prestige goods are used as screening devices, but do not necessarily reflect immediate demand/supply information. Similarly, a Rolls-Royce or a designer garment carries a price that does not merely reflect demand for luxury cars or clothing. Where information costs are high, perhaps because there are many traders, the price of the good is more likely to be used as a measure of its prestige value. Within conventional limits, prices will be responsive to characteristics of current and past traders for the good, especially where it is difficult to determine the precise quality of the good.

It is almost perverse to talk of correcting externalities in an exchange system that exists primarily to generate effects that would be considered externalities in conventional or, as we call them elsewhere, formal market systems. Prestige exchanges invariably benefit more persons than the immediate parties to the exchange, for without public display, exchange that is designed to confer or obtain status or social recognition and promote social bonding and loyalty to kinship or local groups would become meaningless. At the very least, others will be invited to a feast or party to witness the exchange as, for example, at weddings.

Both prestige and subsistence exchange may coexist in space and time. For example, that man cannot live by bread alone is illustrated by the existence of prestige spheres in very simple subsistence societies, such as the Papua New Guinea highlanders described by Rappaport (1968) and Strathern (1971).

Each of the exchange structures derived from economic anthropology, therefore, describes only the particular sphere of exchange under discussion, it is not intended to be understood as a description of the

totality of the socioeconomic life of a people. The individual features of each sphere, as well as the particular mix of spheres, in any society are sources of the immense variety of human organization described by ethnographers (Herskovits 1962).

As pointed out in chapter three, not all such combinations of subsistence and prestige activities in face-to-face societies are to be found in the exotic cultures most often studied by anthropologists. Sociological studies of contemporary urban neighborhoods show that, when excluded from the formal market economy, people often develop informal trading and exchange systems with numerous transactions of goods and services employing a variety of skills. Two exchange structures derived from sociological studies of industrial societies are considered in this report. One, considered essentially non-market is described below. This is called intimate exchange. Another informal economic structure, known as associational exchange, satisfies the conditions of a true market structure, so it is included in the following chapter.

4.3 INTIMATE EXCHANGE

Intimate exchange takes place within communes, cooperatives, self-help organizations, and extended family networks. The object of these exchanges is to emphasize the interdependence of network members at the same time as providing them with access to goods and services that they would be unable to obtain through conventional markets.

To be in the demand for a good or service in this exchange structure, consumers must belong to one or more specific transitive networks. In many respects, intimate exchange networks are comparable to the production/consumption groups of subsistence exchange. Members of effective networks include family, close friends, and kin. Kinship is not restricted to genealogical blood ties. As indicated by Stack's (1974) study of exchange among low-income urban blacks, intimate networks extend to socially recognized kin, encompassing friends who satisfy kinship expectations and can be relied upon to support the group. In Latin cultures this institution of pseudo-kinship is institutionalized as the compadrazzo (Gudeman 1971, Lomnitz 1971). Geographical proximity usually will be important for network integration.

The issue of property rights is central to understanding intimate exchange structures. The title to specific property is held by individual group members who have the right to transfer it both within and outside of the group. However, the entitlement to manage property held within the group is exerted by the network itself. Entitlement to use such property is held temporarily by any member with an expressed need, given that the resource is currently available, and not being used by someone else whose needs are collectively judged to be equivalent. Membership in the network implies that use of property by other members is agreed to voluntarily by owner. Seizure by someone outside of the network is prevented by extra-market legal constraints, such as appeals to the police and the court system of wider society.

Consumption within the network is shared according to the principle of positive reciprocity. The reason for such sharing is a perceived dependency on the network for day-to-day support (Robinson and Henry, 1977). Principles operate which prevent any member from (a) collecting an abnormally large share of the network's resources (Lomnitz 1971); (b) acting in direct competition with other members (Stack 1974); and (c) being denied access to goods and services because of their diminished capacity to reciprocate, as is the case with children, handicapped, infirm or elderly members (Lowenthal 1975). This monitoring process is facilitated by the symmetry of information that is available within an intimate network where everyone is known to everyone else.

Demand for goods or services in the intimate exchange structure may be for survival, as in subsistence exchange, or status, as in prestige exchange. Among low-income groups, there is usually a consistent demand for survival because of the frequency of crisis events. Among high-income groups, demand may be for status or to achieve political office. The act of exchange is performed in many cases to reinforce social obligations among group members, rather than when particular wants arise. "A person who values a relationship will activate it periodically in small matters, rather than wait for a pressing need to arise; he thereby shows his friends that he is ready to be of service to them at any time" (Lomnitz 1971:96).

It follows from the localization of supply and demand within the network, that the suppliers of goods and services are essentially the same as the demanders. This arises from the interdependence of network members and the condition that all skills, resources, and services are shared according to the expressed needs of those members (Stack 1974). Furthermore, it is common to find that members are united by common experiences, which imply similar abilities.

Supply is highly dependent on the operation of the network including the maintenance of boundaries, optimal network sizing, the ability of the network to obtain resources from the outside market economy, and the competence/expertise of network members. The supply of services is fairly continuous as long as the network is sufficiently stable. The supply of goods, however, is highly dependent on the formal market system and usually is characterized by erratic availability.

The major uncertainty facing suppliers is resource availability from the formal markets. To some extent, this uncertainty can be mitigated by gossip channels among networks. Dow's (1977) study of urban poor found that gossip is one of the principal goods exchanged in intimate networks and that one of its functions is to convey information about resource availability. Furthermore, such information is the principal commodity exchanged by brokers or gatekeepers who belong to multiple networks that would otherwise have access only to their own information.

One way to overcome uncertainty of supply is through storage. Indeed, goods may be stored centrally within intimate networks, but particular transaction rules make it likely that this will occur only for short periods of time, if at all. It is more likely that savings

will exist within the network on a group basis, where members repeatedly swap goods with each other so that there is continuous redistribution. Hence, a particular demand for durable goods may not be a final consumption. Stack (1974:33) describes how low-income urban blacks swap durables with each other in order to trade them for daily necessities. "As people swap, the limited supply of finished material goods is perpetually redistributed among networks of kinsmen and throughout the community."

There is more certainty about services since the network consists of a limited number of identified consumers and suppliers. Services are stored in the skills of the members, where a constant inventory level is maintained for network stability. Information about members' skills is readily available within the network which enables people to calculate the total resources available at any time.

Bids to obtain goods or services within the network are made by expression of need in the course of daily interactions. In some cases this may be direct, while in others it may be a general expression of need, thus allowing suppliers to propose the terms of the good or service. Among the Chilean middle classes, "In requesting or returning a favor certain rules of civility are observed in order to avoid mutual embarrassment. Requests for favors are intimated, suggested, or phrased as requests for advice, so that the compadre is free to propose the service on his own terms" (Lomnitz 1971:96). However, a fundamental aspect of the bids to buy in the intimate market is that there is limited shopping around in the network. Thus, consumers do not have the option of making comparisons across a number of suppliers since this would undermine the trust of the social relationship.

Offers to supply goods and services in the intimate exchange structure are made without expectation of direct and immediate material returns. The obligation to return is left implicit in the offer. In addition, there is the principle of adequacy of response which, according to Lowenthal (1975:464) "requires that those responding to a need do so as fully as they are able even though the person in need may not have responded to others to the same extent owing to his own limitations."

Offers are affected by timing in one of three ways. The first is to respond to an expressed need of the consumer. In this case, the supplier attempts to fulfill completely the need of the network member. In the second case, where an expressed need is not outstanding, sellers will offer goods and services to maintain a debt balance with other network members (Davis 1972). This debt balance is crucial to reinforce the relationship among members and ensure that it will exist for the times that there are expressed needs. Finally, offers to sell will depend on resource availability.

Maintenance of debt is one way of smoothing the effects on the network from resource uncertainty. It also provides the means whereby externalities are corrected within the network. Prices for goods and services are negotiable after the transaction through evaluation and adjustment of the running debt balance. Price adjustment also is

facilitated by the absence of an explicit medium of exchange, since members use a barter system.

Membership in the network is essential to both the legitimization and enforcement of transactions. Thus, members have some notion of their standing in the network and social pressure is used to make them conform to the rules of the group. These rules include the requirement that certain transactions be maintained, such as the running debt balance between traders, multi-stranded transactions, and the habitual exchange of goods and services in the absence of a needs or wants motivation. Failure to live up to norms of participation is met by moral pressure exerted through shaming and the use of mild to severe verbal aggression, irony, ridicule, and condemnation (Henry 1983). These evaluations are constantly delivered through gossip, as shown in Mars and Altman's (1983) study of Georgian jewry. The pressure to comply with consumer requests occurs even at great inconvenience to the supplier. The quality of the performance is a major determinant of the supplier's standing in the network (Lomnitz 1971).

In certain respects, the intimate exchange structure may be viewed as a hybrid of subsistence and prestige exchange. However, it is unique in that it is found within, and often opposed to, the larger economic structure of contemporary industrial society. Intimate exchange, identified in sociological studies of self-help and hidden-economy activities, exists as a parallel economy to the market exchange structures described in the following chapter.

5. MARKET EXCHANGE STRUCTURES

This chapter follows the same format as that preceding in discussing the rules for exchange structures. However, the rules of the exchange structures that are presented in this chapter imply a different allocational outcome and fulfill, in various degrees, the conditions constituting a market process.

In directing production and distribution, market exchange structures do not rely on fixed-allocation rules arising from custom or command. Rather these exchange structures rely on rules that are more responsive to the desires of traders engaged in the transactions for goods and services. In addition, the rules of the market exchange structures allow a good deal of choice over transaction options. As a result, current demand and supply conditions have a much greater influence in market structures than non-market exchange structures.

The market exchange structures discussed in this chapter span a broad range of exchange activities. The peasant marketplace (from economic anthropology) and associational markets (derived from the informal-economy literature) are followed by the neo-classical economic model of the perfectly competitive market and the extreme example of the absence of competition, the monopoly market. The characteristics of perfect competition and monopoly can be considered as two extremes of the formal-market spectrum. Several other variations of imperfectly-competitive markets are also described insofar as their rules vary from those of monopoly markets.

5.1 THE PEASANT MARKETPLACE

The peasant marketplace consists of persons who produce for trade, usually in localized marketplaces (Dalton 1964). Despite this difference from the subsistence sphere, the contrast between peasant and subsistence production is largely institutional and economic rather than technical. For example, where both are based on agriculture, they are likely to use small family-managed land allocations. Where both are based on pastoralism, peasant producers and subsistence producers are likely to exploit open-access grazing rights.

The technology and applied science available to peasant farmers and pastoralists may be indistinguishable, in some cases, from that available to the subsistence producer (Nash 1964). The contrast is that unlike the subsistence sphere, with its emphasis on self-sufficiency and isolation, peasant producers are outward looking, seeking to produce for trade, often with urban populations who will provide the peasant producer with manufactured goods or money (Firth 1951).

Demand may be made by anyone entering the marketplace with goods to exchange or money to purchase. However, differential transportation costs may constrain entry unless rotating market mechanisms are used,

for example, shifting the location each day on a weekly cycle (Nash 1964). Demand is principally for survival or to benefit from differential skills or preferences. In some cases peasant-market producers specialize to the exclusion of maintaining their own subsistence and rely exclusively on the market trade for other goods (Lewis 1951). Consumption is shared at the discretion of the buyer, usually within a co-resident extended family.

The goods and services traded in the peasant marketplace may be divisible or indivisible, homogeneous or differentiated. Most agricultural goods are homogeneous, but limited manufactured goods may be traded. However, most trade is for agricultural products, fish, pastoral products, etc. which are produced on peasant smallholdings. The supply of such goods tends to be highly seasonal, depending to some extent on climate and location. Purchase of large, predominantly non-seasonal items may be lumpy, for example, livestock. Generally, storage is limited to salted, dried, or smoked products, or to live storage on the hoof. Incentives to store may depend on extent of seasonal variation.

Suppliers are admitted to the peasant marketplace on the same basis as demanders. However, suppliers may prefer to deal with regular customers with whom personal ties reduce risk (Mintz 1961). Offers to sell are made by displaying goods in the marketplace.

Technical constraints on supply include the simplicity of hand tools, a low level of technological sophistication, and reliance on human labor power which is inexpensive relative to other resources of production. Institutional constraints include the nature of land-tenure patterns and rules, inheritance rules, especially for land and cattle rights, a low-level of division of labor, and problems of mobilizing human labor for large projects such as irrigation, bridge construction, etc. Natural constraints include seasonal variation, weather conditions, and soil quality. Also, constraining are the availability or proximity to raw materials for specialist activities such as blacksmithing, potting, medical services. Major uncertainties to suppliers are seasonal/weather variations, and public health effects on labor power.

The supplier in the peasant marketplace holds the title to produce, but may or may not hold title to land. In such cases of usufruct, the landowner may have title over various portions of the produce. As in subsistence economies, land actually may be a common resource (Scott 1976), privately managed, with the landowner, or village chieftan responsible for the allocation of manager. Otherwise, the entitlement to use and manage property belongs to peasant farmer (head of household), and the condition of exclusivity applies insofar as goods and services are treated as private property.

Likewise, the transferability of property is maintained, except for land. Severance rituals (Mauss 1925) to break the social bond between beast and master may be invoked in transference of livestock from one owner to another. Bids to buy in the peasant marketplace are made by inquiry about the asking price to a producer/vendor as a basis for haggling. The location of such bids that are made depends on the goods

or services, but principally will be made at a customary marketplace. The timing of bids to buy is determined at regular intervals established by custom, for example, at daily or weekly markets, seasonal fairs, etc (Bohannan and Dalton 1962).

The medium of exchange in peasant marketplaces may be cash or barter. The object of exchange is usually for a direct monetary equivalent. Transactions are characterized by haggling both before and after repeat exchanges. Haggling is pervasive in these market structures, possibly because time is a relatively less expensive resource than other resources. Moreover, the face-to-face (non-anonymity) nature of the exchange forces traders to negotiate given their conflicting objectives. The conflict stems from the condition that the single seller is a monopolist (at least for a single contemplated transaction) and the single buyer is a monopsonist (again, for this single transaction) and neither of them is a price-taker. The balance in their market power implies that this is a situation of bilateral monopoly. In such a situation, the negotiated price will be lower than the price preferred by the monopolist and higher than the price preferred by the monopsonist.

Transactions are legitimated by handshake, exchange of goods, or, sometimes for livestock, a severance ritual, intended to symbolize consent. Transactions are enforced through repeat exchange, the maintenance of the market peace by a political patron, or the extra-market legal system.

Identifiable externalities may be negotiated between the producer of the externality and the affected party. However, it is likely that externalities go unrecognized.

5.2 THE ASSOCIATIONAL MARKET

The associational market consists of a looser-knit network than the intimate exchange structure discussed in chapter four. The goods and services that are offered through this structure may vary over time depending upon availability. Exchange here is less likely to be essential for survival than in the intimate exchange structure. Participation is usually motivated by a desire to obtain goods cheaper than in the formal market, or for status, or for goods that are unavailable in formal markets.

In describing the irregular or illicit sources of goods in associational markets, we are not referring to those that have been expropriated unwillingly from holders of legitimate property rights. Goods obtained in this way are considered to be circulating in what we call the criminal variant of associational exchange. The associational market consists of items sold by wholesalers direct to individual consumers, goods that are taken from the workplace as "perks" with the complicity of the employer, or are produced without respect to legal requirements for weights and measures, quality, or licensing requirements. Examples of these last items would include homemade preserves and wine, homebrewed beer, and certain quasi-professional

services such as legal or financial advice and veterinary or medical treatment.

Demand for goods and services in the associational exchange structure is made by members of extended networks which include friends, co-workers, neighbors, acquaintances, and friends of friends. In contrast with the intimate exchange structure, associational networks are extended and, thus, are characterized by low transitivity. However, to protect the network, new consumers will be tested by extensive verbal probing and a relationship of temporary intimacy will be established prior to admittance in the network. However, demanders generally act on their own behalf in associational markets so consumption is unlikely to be shared.

The goods and services traded in the associational exchange structure are predominantly differentiated. Demand for them may be prompted by a variety of motivations including status, to obtain goods unavailable in formal markets, or to reduce the costs of goods by avoiding formal market business stages. For most legitimate goods there will be sampling, thus, trust in trading partners is not a constraint on demand. For other goods which are illicit or irregular, non-divisible, or obtained through greater distance in the network, trust will be important in the relationship.

Suppliers, on the other hand, enter the associational market because there is unemployment of their resources in the formal market, because they are already members of the extended network that supports it, or because there are institutional constraints in the formal market that they seek to avoid. However, activity in the associational exchange structure is seen as either temporary or supplemental to legitimate income sources (Henry 1978).

Bids to buy are made, at any time, on the basis of comparisons with the formal market for legitimate goods. Buyers are free to accept or reject any offer from the network. For irregular goods, there will be far less discretion afforded to consumers with the exception of removing themselves from the market entirely. Offers to sell are made through the network but, unlike the intimate exchange structure, suppliers are free to accept or reject any offer to buy. Also in contrast with intimate exchange, offers to sell are made with the expectation of equivalent and immediate material return. Goods and services are generally valued in monetary terms but this need not always be the medium of exchange. Prices are negotiable prior to consumption but not after consumption has taken place. The legitimization of exchange contracts is implied by the consent of the trading parties.

The timing of offers to sell is constrained by the supplier's ability to obtain goods and services from formal markets. Unlike the intimate markets, services in the associational markets also are constrained since suppliers are faced with large opportunity costs of diverting supply from the formal economy to the informal sector.

Buyers and sellers have equal control over where transactions take place for most cases. The place where offers to sell are made is

constrained generally by loose network boundaries. Similarly, the physical or geographical location of the network will affect where supply occurs, but not to any great extent. The location of supply may be more severely constrained by the need to conceal goods and services from existing legitimate traders, regulators, or enforcers in the formal markets.

In fact, a wide range of constraints is placed on the associational exchange structure by its dependency upon the regular market economy. For instance, although the parasitic nature of associational exchange combines with its wider social network to make the timing of supply less erratic than in the intimate market, its dependency and irregularity make members vulnerable to sudden breaks in supply (Mars and Nicod 1984). Associational exchange is highly correlated with the business cycle in the formal markets and is often the first area to be cut back or scrutinized by institutions of the formal economy under poor market conditions.

Indeed, major institutional and technical constraints on supply depend on the degree of policing and security, and on prices relative to the legitimate market. The type of supply also depends on the formal occupation of the supplier who is the source of the supply to the associational market (Mars 1982). Hence, major uncertainties face suppliers concerning the state of the formal economy and changes in the level of policing. Information asymmetries exist in both demand and supply. Buyers may lack information on sellers especially where the transaction is illicit. Sellers may lack information on the value of the goods or services to buyers because such information is costly to collect. The cost of collection will depend of the observability and frequency of associational transactions.

Furthermore, the informal nature of the supply implies that there are high opportunity costs for producers to store, thus, storage is unlikely. In addition, to the extent that the supply is illicit, storage will be a risky activity implying that the tendency is for immediate distribution (Henry 1978).

Property rights in the associational exchange structure do not necessarily recognize those of the wider society. Inside the network, the titles to resources are held by trading agents, who also are entitled to use, manage, and transfer the property. Because certain property rights are not completely shared, there may be some external effects for traders related to the associational exchange. For example, wholesale trade with a final consumer is regarded as illicit by retailers. The retailers may undertake monitoring activities or impose sanctions on the wholesaler as a result. These costs are an externality of the wholesale-final customer transfer of property.

Property rights are only enforceable through exclusion from the network or threats of retribution from members with greater market power. The exception to this is where the owner is endowed with the right of enforceability by the extra-market legal system. Similarly, the enforcement of contracts also is performed loosely by the

recognition of opportunities for repeated exchange or competition from legitimate sources.

Within the network, externalities, to the extent that they exist, will not explicitly be adjusted. Outside the network, attempts will be made to recover losses that are due to informal trading.

5.3 THE CRIMINAL VARIANT OF ASSOCIATIONAL EXCHANGE

The criminal variant of the associational exchange structure is that in which the goods and services that are traded have been stolen, obtained by fraud, or are defined by the extra-market legal system as illegal goods. This category includes contraband, illegal drugs, hardcore pornography, stolen property, and the services of pimps, prostitutes, and assassins. To belong to the criminal exchange structure, as opposed to simple associational exchange, most suppliers are those that obtain the majority of their income from the criminal market. This exchange structure possesses certain restrictive rules specifically deriving from the need to avoid apprehension by society's regulators, such as the police or securities commissions, as well as from the organizational structure of criminal enterprises. For example, consumption of the fruits of criminal activity may be individual or shared according to the distinct hierarchy of a criminal gang.

Demand, in some cases of criminal exchange, may be for survival, status, or merely the desire to obtain something for less than its formal-market cost. In all these cases, sampling of the goods will be very restricted, although there may be some opportunities for repeat exchange. Criminal suppliers are severely restricted by a system which is comparable to formal-market licensing. The location of supply depends largely upon the legitimate activities that are the source of goods, and can occur anywhere where detection by external regulators can be avoided. The timing of supply depends on the changing opportunities afforded by legitimate institutions, e.g., changing law enforcement or changing restrictions imposed by regulation of the formal markets. Storage is possible but the illegal nature of supply implies a requirement for transient supply outlets. Two major uncertainties are the possibility of getting caught and untrustworthy sources of information.

Goods and services are always slightly differentiated, especially by differences in suppliers or the terms of negotiation. For particular goods or services, such as prostitution or stolen property, they may be highly differentiated.

Bids to buy must be made under a veil of secrecy, as efforts are made to restrict information about the intention to bid. This factor, plus the nature and quantity of goods determine where bids to buy are made. If demand is for survival, then the timing of such bids is constrained by immediate need. Otherwise, bids to buy are likely to be made very close in time to the actual exchange. Similarly, offers to sell will be linked in time to offers to bid since this reduces the risk

of leaking information to others. Hence, information about the intention to supply is very restricted.

Most offers to sell will be made from transient supply outlets and are likely to be based on a fixed pricing rule. Money is the medium of exchange. Negotiation may occur prior to consumption but not after the transaction is completed, while enforcement of contracts is performed by the threat of exposure, or the sanctions of the criminal corporation.

Within the criminal market, private property rights prevail over exchanges. Outsiders, from whom goods were unwillingly or unwittingly obtained for introduction into the criminal market, do not recognize the internal property rights as legitimate and will attempt to regain property through the extra-market legal system when possible. This exposes owners to the risk of confiscation. Hence, for some illicit goods and services exclusivity may not hold.

To the extent that the sources can be identified, there will be attempts to adjust for negative externalities both within the criminal market and between the criminal market and the formal economy.

While the peasant and associational structures can be considered as having a combination of traditional and market allocation rules, the formal markets respond very directly to demand and supply conditions. Among the formal markets, the perfectly-competitive market produces the best economic result, where all factors of production are employed up to the level that exhausts their net social benefit and all goods are traded up to a level that exhausts the net gain in consumers' utility. However, the result relies on the complete absence of market power and uncertainty, which are prevalent in real-world markets. Markets that are less than perfectly competitive also respond to demand and supply conditions, but the allocational results involve waste and payments to resources above and beyond their true value in production. To appreciate the influence of the competitive forces in the market, we present first the rules of the perfectly-competitive market and then those of the monopoly market where the absence of competition among suppliers is complete.

5.4 PERFECT COMPETITION

The major characteristic of the perfectly competitive market structure is the complete absence of market power on the part of any buyer or seller. This characteristic emerges from the rules and conditions that apply to the demanders and suppliers, as well as the requirement that transactions are conducted under effectively certain conditions. As a result, the transactions conducted in a perfectly competitive market structure are distinct and divisible, and occur between anonymous traders. Although no true real-world example exists of this structure, markets like those for shoes, textiles, and clothing come close to exhibiting the rules of the perfectly competitive market.

There is a large number of buyers in the perfectly competitive market, such that no individual or group faces differential access to

the market. For example, anyone willing to pay the price of a pair of shoes may demand them. Coalition formation among buyers is ruled out either because bargaining is costless and an allocational outcome is achieved that could have been achieved through competitive behavior (Aumann 1964), or because bargaining is very costly, thus, competitive bidding in the market is cheap (Arrow 1969). Where it is practical to form coalitions, demanders may do so to increase their market power, a consideration that is discussed in a later section.

Consumption in the perfectly competitive market usually is limited to the individual trader. If sharing exists, it is so minor that it does not alter the allocational and distributional characteristics of the market. Similarly, consumption must be effectively divisible so that no barrier to consumption exists. For example, if goods are lumpy as with housing, then demand is unlikely to be very repetitive and sampling becomes a major source of informational disparity among demanders.

No distinction is made between survival and status since it is assumed that all demand arises from wants and utility maximization. Furthermore, the large number of buyers implies that demand in the competitive market cannot be of the sort that arises out of an immediate need, unless a large number of consumers are subject to the same crisis event.

As with the demand side of the market, there is no differential access to the market imposed on sellers and no positive return to coalition formation. There is easy entry and exit in the market so that firms can emerge and leave according to the price signals they receive from the market. Economists refer to this condition as the perfect mobility of resources. Restaurants in large cities are a good example of the easy entry and exist of firms in the market.

High resource mobility guarantees that supply will occur anywhere and anytime that suppliers receive an adequate price for their goods or services. There is no incentive to store goods in this structure, since there are no major uncertainties and no constraints on market entry or exit.

While there are no differential physical or technical constraints on supply, there are constraints arising from competitive behavior and profit maximization. In particular, in the short run, suppliers will produce only if price covers variable costs, in the long run only if price covers average cost. Further, the competitive pressures on firm survival will drive all firms to the same long-run production conditions where all extra-normal profits are eliminated. This results from the rule that goods and services are homogeneous. Since all Idaho potatoes are fairly similar, no one Idaho farmer can expect to receive a price that is substantially different from the price received by his/her neighbors.

All of the property rights in the formal markets discussed in this chapter largely follow the rules of private property. The title to property is held by individual owners or corporate entities. In

general, property is allocated to the use that results in the most production or consumption value (Umbeck 1976). This allocational rule is actually an outcome of the private-property rules where: owners hold the rights to use and manage the property, owners receive all costs and benefits derived from the use of the property, and rights are both fully transferable and fully enforced.

When conducting transactions, buyers are price takers. This means that no single demander can influence price by the decision to buy. Price is accepted by the demander if it is less than or equal to the consumer's marginal valuation of the good or service. This is an outcome of utility maximization across goods. Sellers are price takers but have control over the amount they supply to the market. The suppliers accept prices if they are greater than or equal to the incremental cost of supply and set production at the profit maximizing level of output.

The price-taking rule implies that bids to buy and offers to sell are not limited by any temporal or spatial restrictions. Traders observe a certain price in the market and can purchase or sell as much as they want at that price. Prices may change over time, but the changes occur because of the aggregate actions of the market traders. Individual actions have an insignificant impact on the market price.

In most formal markets, the price system is used to value goods and services. In perfect competition, the price mechanism requires a costless medium of exchange, e.g., currency to prevent the medium of exchange from imposing a restriction on market entry. In the aggregate, prices are bid up by consumers in situations of excess demand and bid down by suppliers in cases of excess supply. Consumers and producers can respond immediately to the price signal and adjust their quantity decisions.

An alternative mechanism, that could be implemented through a computer network, is a costless bidding system where the plans of buyers and sellers are reconciled by their responses to announced prices (Smith 1986). After collecting the information on excess demand and supply from the two groups, the auctioneer continues announcing prices until the market clears exactly. Trading may not be allowed outside of this process. In this case, money is not a necessary condition (the price of a good relative to some other good may be used), but if money is not used the transaction costs of completing the exchange must be negligible.

Transactions in the perfectly competitive market are legitimated through consent of trading partners subject to the rules of the extra-market legal and regulatory system. Transactions are enforced by repetitive transactions and competition from alternative buyers and sellers. Since information is freely available and symmetrical, externalities do not exist which have not been eliminated already by costless negotiation.

The rules of the perfectly competitive market restrict market power on the demand and supply side of the market. Because the salient rules

and features in the imperfectly competitive, oligopoly, and monopoly markets emerge from the existence of market power on the supply side, rules which refer to demand are essentially the same as in the perfectly competitive model. In other words, to present the supply-side rules, it is assumed that perfect competition holds on the demand side of the market. Following the oligopoly discussion, this assumption will be relaxed and countervailing market power will be explored for the consumers.

Also, it should be pointed out that the rules are based on the unregulated characteristics of the formal market structures. Regulation, generally undertaken to correct for market failure to achieve desired results or the retention of market power, will alter the rules that would emerge if market agents were left to operate on their own. Thus, government creation of a regulated monopolist or industry licensing by regulatory institutions are extra-market constraints that have obvious implications for the selected rules, but do not emerge directly from the underlying conditions and assumptions regarding market activity.

5.5 THE MONOPOLY MARKET

In the pure monopoly market, there is one and only one supplier of the good and service with no close substitutes available. As is the case with the perfectly competitive market, it is difficult to find many real-world examples of a pure monopoly. However, monopoly markets effectively may exist within localized economies, where close substitutes for some goods are expensive to obtain due to high transportation costs. Certain entertainers, artists, scientists, or athletes also may be considered as monopolists in the sale of their skills.

Internationally, examples of monopolies are found where state-owned firms are protected from domestic competition such as Atomic Energy of Canada Limited, which is the only exporter of CANDU power reactors. In addition, some countries do not impose anti-trust regulations on domestic private firms, thus, natural-resource monopolies may be quite persistent over time, e.g., the DeBeers diamond monopoly in South Africa. In the US, formal anti-trust legislation has existed since 1890 with the passage of the Sherman Act, making it illegal for a firm to monopolize trade or commerce in several states or countries. The landmark application of the Act occurred in 1911 when the Supreme Court found Standard Oil of New Jersey guilty of monopolizing the petroleum refining industry and ordered that the company be dissolved (Scherer 1970).

A possible reason a monopoly may arise is the unique location of some input to production. Further, when supply occurs may be affected by the supply of inputs or resource uncertainty. Generally, a unique product is being considered. If the monopolist supplies more than one type of good, and is a monopolist in each, then more than one monopoly market exists.

The key to the monopoly position of the seller is the ability to prevent the emergence of rivals. Given the possibility of profitable trade, other potential suppliers must perceive some barrier to entry in the market. This barrier may be technical, e.g., economies of scale, erected by other institutions, e.g., a supply critical to national security, or created by property rights, e.g., owning the only source of an input. Control over the critical resources for the production process or complete and exclusive knowledge of that process are likely ways for a monopolist to eliminate the possibility of rivalry.

Where storage of the good or service is possible, it may be highly profitable depending on the monopolist's expectations of the future. This would be especially true where current production is cheap and the monopolist expects a significant increase in the demand for the good in future periods.

Major uncertainties are likely to be present in the monopoly market. In particular, the duration of the monopoly is highly uncertain in the face of regulation, technical change, and changing demand conditions. Monopoly behavior can be regulated by the threat of competition, even where it does not exist presently (Baumol, Panzar, and Willig 1982)

Private-property rules apply in the monopoly market as in the perfectly competitive market. The only distinguishing consideration in the monopoly market involves the exclusivity rule. Monopoly pricing behavior will cause a reduction in allocational efficiency in comparison to the competitive conditions. This implies that some resources will not be employed in their highest-valued uses across all markets. Thus, there are costs involved in the monopoly management of resources that will not be incurred by the monopoly owner (Shepard 1979).

The rules under which bids to buy are made may be dictated by the monopolist since consumers will be price takers and the monopolist may discriminate among different consumers. With price discrimination, consumers are separated into groups according to how much they value the good. The group that values it the most will be charged the largest price. Price declines as the groups' valuations decline. However, price discrimination requires that resale is not possible among the discriminated groups (Henderson and Quandt 1971). Otherwise, the group that obtained the good for the lowest price could try to compete with the monopolist and sell to groups with higher valuation levels.

Offers to sell may be according to customer classes if the monopolist discriminates. In general to maximize profits, the monopolist will restrict the quantity available in the market at the level where the change in total revenue (marginal revenue) just equals the change in total costs (marginal costs) for producing one more unit of the good. Unlike the perfectly competitive supplier, who cannot set price, the monopolist may maximize profits by setting either the price or the output, however, setting one will determine the other.

Crever (1984) argues that the monopolist may offer non-price incentives initially to attract customers and establish the market.

Once established, the monopolist can remove the incentives and exploit the monopoly position. Establishing market power by the monopolist allows the seller more control over when and where offers to sell are made, since buyers lack any significant bargaining power.

While goods are priced by the monopolist, demand must be noted in order to maximize profits. However, negotiation of prices is ruled out because buyers have essentially no market power. The monopolist recognizes that each increase in supply can be absorbed by industry demand only at a lower price, i.e., demand varies inversely with price. A uniform pricing rule (no price discrimination) will cause the price to fall for each increase in supply if the supply is to be fully absorbed by the industry demand. Under these conditions, the monopolist is aware of an additional cost of increasing output; a cost that is over and above the production cost of the good. Consequently, the monopolist restricts the level supplied to the market to reflect this additional cost. The cost is additional in the sense that a perfectly competitive supplier would not recognize it, and therefore, total industry output would have been greater and price would have been lower under pure competition. At the restricted, monopoly level of supply, the total revenues exceed total cost of production by an amount economists call monopoly rent.

Transactions in the monopoly market are legitimated by consent of the traders subject to the rules of the extra-market legal and regulatory system. Transactions are enforced by the threat of the monopolist to withdraw supply.

Being the sole source of supply, the monopolist can observe very precise information on consumers' valuations of the good or service. On the other hand, information regarding the production process of the inputs to production is likely to be very restricted to protect the monopoly position. As a result, there are significant asymmetries in information in the market. Coupled with the severe inequality in market power, externalities are likely to be absorbed by consumers.

The imperfectly competitive and oligopoly markets also involve market power on the part of suppliers, however, to a much less degree than pure monopoly. Although the imperfectly competitive and oligopoly structures are considered to be the most representative of actual US markets (Shepard 1979), analysis of these structures is difficult because the combination of competition and market power renders some of the rules ambiguous.

Further, it has been long recognized that firms engage in activities that reduce the level of competition in their industries (Tollison 1982). However, the reasons they do this is a matter of debate. One side has argued that firms integrate either horizontally or vertically to increase their market power and thus, their profitability. However, the source of this profit is not from better ideas or better products, but rather, through the restriction of output and the increase in prices (Bain 1968).

The other side of the argument claims that market concentration and control of inputs and outputs of production is undertaken to respond to transactions costs. These costs may arise from trying to discover prices in the direct and separate pricing of activities (Coase 1952, Cheung 1983); insufficient market for risk reduction especially with respect to assuring an input or output market (Williamson 1975); indivisibilities in activities such as R&D (Stiglitz 1986); and as responses to the risks implied by asymmetries in information, especially with respect to quality (Barzel 1982) or effort (Stiglitz 1974). Many of the same explanations are effective in understanding coalition formation (attempts to increase market power) on the demand side of the market.

5.6 IMPERFECT COMPETITION

Imperfect competition resembles perfect competition in that the number of sellers is sufficiently large so that no one firm has substantial market power at the industry level. In addition, products are differentiated slightly. Each supplier offers some special feature that makes its product different, but the overall function of the products is the same. Suppliers may compete on the basis of quality (or at least the perception of it), research and development activities, and non-price incentives offered to consumers.

When and where the generic supply occurs are not constrained because there is easy entry and exit of suppliers, i.e., free mobility of resources. However, for any particular supplier, this may not be true. Each supplier enjoys some attribute that makes it different from its rivals. The time and place of trade may be this attribute. For example, shampoo is readily available in most drug stores, but certain shampoos are sold only through hair salons.

In the imperfectly competitive market, there are no significant constraints on the industry as a whole, but there may be technical or institutional constraints on individual suppliers, such that no two are identical. Each breakfast cereal contains some special ingredient to distinguish it from competitors. Where it is difficult to prevent other firms from duplicating a production process, firms seek institutional restrictions on market entry such as patents and trademarks.

The extreme competition among firms has a number of implications for supply rules. Supply may be storable but returns will be limited to a level that just covers cost. The objective is to keep an inventory that allows the supplier to respond quickly to changes in demand, but the likelihood of capturing a large portion of any increase in demand is small. The major uncertainty facing suppliers is their ability to retain their small market shares. Thus, they may actively seek established trading relationships with consumers. In addition, advertising will be used to distinguish a firm's product as well as signal its presence to potential customers.

Individual suppliers face their own unique set of demanders, like the monopolist, but the existence of many close substitutes implies that

demand will be very responsive to changes in the imperfect competitor's prices (Chamberlin 1956). Furthermore, in the long run, extra-normal profits will be competed away by new suppliers entering the market (although, their products also are differentiated slightly).

Suppliers offer to sell when marginal revenue exceeds or equals marginal costs. However, this rule may be violated when they are trying to establish greater market shares. The pricing strategy of the imperfectly competitive firm differs substantially from that of the monopolist because in the long run, the imperfect competitor will be forced to supply at a level where total costs are just being covered by total revenue. However, this level will always imply that there is excess capacity for each supplier, i.e., they are not operating their production process at the level of lowest costs. This is one of the major inefficiencies associated with imperfect competition. Each imperfectly competitive firm uses the pricing rule of a mini-monopolist where the output level is less than a perfectly competitive firm, but as soon as extra-normal profits are observed, new rivals enter the market and compete the excess profits away. As a result, there are too many firms in the market and price for the generic good is higher than it would have been under perfect competition (Margolis 1985).

Prices are not negotiated directly between buyers and sellers because of the limited market power. Although sellers attempt to set prices, realistically they can control only a narrow range of price due to the high level of competition in the industry. The need to distinguish themselves from competitors may imply that a good deal of resources flow to advertising. Kirzner (1973) argues that this is actually a beneficial aspect of the imperfectly competitive market, but others see it as a wasteful use of resources (Bain 1968).

Transactions are enforced by the existence of repetitive demand and the presence of competition from other suppliers. On the demand side, since all products have some distinguishing feature, there is limited enforcement implied by the threat of withdrawing the supply. Because there are no major uncertainties to act as a barrier to entry, there is limited asymmetry in information about the uniqueness of the product. However, firms actively may pursue exclusive research and development projects to increase their relative market share.

Imperfectly competitive market structures imply some inefficiency in the economy. The costs of this inefficiency will be absorbed by the economy in the absence of regulation. On the other hand, imperfectly competitive markets adjust quickly to changes in market conditions and, therefore, produce some stabilization externalities.

5.7 OLIGOPOLY

The distinguishing feature in the oligopoly market is that either there are only a few suppliers in the industry or a large segment of the market is dominated by a few large suppliers. The product supplied may be differentiated, as in the case of pharmaceuticals, or homogeneous, as in the case of rail-freight service.

There exists some constraint on market entry or exit that generates an environment susceptible to control by a small number of firms. Generally, this will arise from economies of scale or mergers in the industry. These mergers can be among firms producing the same generic product (horizontal integration) or among firms which produce related input and output products (vertical integration).

The major uncertainty facing the oligopolist is the reactions of its rivals to price and output changes. As found in the imperfectly competitive market, maintaining market share is an important concern for the oligopolistic supplier. There may be particular uncertainties such as technological risk or uncertain rewards for innovations that cause oligopoly to be a necessary type of market structure. In these cases, a more competitive structure is inconsistent with the undertaking of large risks (Schumpeter 1942).

Because there are no generally accepted behavioral assumptions for oligopolistic behavior, there are numerous solutions for the pricing rules under this market structure (Henderson and Quandt 1971). The rules presented here vary largely on the basis of assumptions regarding the oligopolist's perception of the actions of its rivals. Under one rule, the oligopolist sets its price according to a reaction function which depends on its own cost conditions, the market demand, and the output of its rivals. To construct this relationship, the oligopolist assumes that its own action will not alter the output of its rivals, i.e., there is no interdependence in the industry. Thus, the oligopolist considers the profit-maximizing level of its own output for each possible level of output of its rivals. It selects a particular level by observing the level forthcoming from its rivals. Of course, this action is likely to lead to a change in its rivals output level, given they have their own reaction functions, which will cause the oligopolist to select another level. Market stability can be established when there is no longer an incentive for any supplier to change output.

Using a collusive rule, oligopolists may recognize their mutual interdependence and act in unison to maximize the total profit in the industry. However, if one of the oligopolists believes that each of its rivals will hold production constant, there will always be an incentive to cheat. This implies that collusion solutions are unstable in the absence of monitoring and policing agreements by the colluders (Varian 1978).

As another alternative, oligopolists may allow one supplier to be the price leader, i.e., rivals will mimic whatever the leader does with respect to price. This will result in a pricing outcome similar to pure monopoly.

Finally, the oligopolist may face two effective demand environments because of the reactions of its rivals. The first applies for price increases, where rivals keep their prices constant and, thus, increase their market shares relative to the supplier that raises price. The second applies for price decreases where rivals follow suit to retain their relative market shares. Such a situation generally implies that

the most profitable pricing policy for the oligopolist is not to change prices unless there is some significant change in its cost conditions.

Whatever pricing rule is used, the oligopolist can continue to earn extra-normal profits in the long run like the monopolist. Although there can be significant competition from rival firms, it does not approach the level of competition found in perfectly competitive or imperfectly competitive markets.

Legitimation of transactions is performed largely by consent between consumers and suppliers. Among suppliers, there may be conditions as part of a collusion agreement or cartel. Transaction agreements with demanders are enforced by the threat of withdrawing the supply. On the supply side, transactions are enforced by the presence of rivals. Again, among suppliers there may be sanctions imposed by a cartel.

Because of the significant market power enjoyed by the oligopolists, information is likely to be asymmetric between suppliers and consumers. Among suppliers that act as rivals this will also be the case. If suppliers collude, then information may be shared symmetrically.

5.8 LESS THAN PERFECT COMPETITION AMONG MARKET CONSUMERS

The behavior of product demanders endowed with varying degrees of market power is analogous to that of the supply models presented above. In fact, economists use the term oligopsonist and monopsonist to refer to few and single buyers, respectively. Because of the similarities, it is not necessary to repeat all of the rules outlined above. Instead, we present the salient implications of market power on the demand side.

In the case of a single buyer facing a competitive supply, the entire industry supply curve becomes the relevant information for the purchase decision. Like the monopolist, who recognizes that increases in supply led to a fall in price received because industry demand varies inversely with price, the monopsonist recognizes that, generally, industry supply curves vary directly with price. From the monopsonist's point of view, each additional unit that is purchased implies a slightly higher price than the last unit. Furthermore, if the monopsonist cannot discriminate among suppliers, i.e., it must pay a uniform price for all purchased quantities of the good or service, then the average cost of its purchases will be increasing with increases in the quantity purchased. Thus, for the non-discriminating monopsonist, price is determined by its level of demand. The higher the level, the higher the price it will pay for all units of the good or service. This leads the profit-maximizing monopsonist to purchase a lower quantity of the good or service than would be purchased if perfect competition existed on the demand side. When a monopsonist faces a monopolist on the supply side, then their market powers are balanced and to some extent this may force them to collude and achieve the competitive market conditions (Henderson and Quandt 1971).

Market power which is concentrated in a few buyers facing a competitive supply will lead to oligopsonistic behavior. However, as in the oligopolistic market structure, there is no single solution to this problem. Oligopsonists may either recognize or not recognize their interdependence, collude or fight each other. In any case, there will be some market effects in that quantities purchased and prices paid will be lower than under the competitive conditions, unless supply is also characterized by market power.

5.9 LINKAGE TO SCENARIOS

The exchange structures presented in this and the last chapter cover a wide spectrum of exchange activities. The applicability of each exchange structure in a particular economic environment depends on the whether or not the rules of the structure are consistent with the conditions of the environment. In some environments, the rules of an exchange structure may be highly improbable or unstable. In addition, exchange structures exist rarely in isolation, so the interdependent effects between structures are also important in assessing the applicability of the structure.

The next four chapters examine each of the post-disaster survival scenarios delineated in chapter one. Each scenario establishes the survival conditions for resources and institutions. Under the assumed survival conditions, we explore the major problems faced by traders and ask what structures are applicable to constitute exchange activities. Within each scenario, we pay particular attention to how the primary and secondary functions of social exchange are performed. We use information about the functions to suggest the likely ways survivors will address such issues as the resolution of property rights, currency and credit, shifts in the demand and supply conditions, and re-establishing authority and trust.

6. THE BEST CASE

The best case scenario for post-disaster economic recovery is that in which institutions and resources survive largely intact. In the case of nuclear attack, it is assumed that the powers involved confine themselves to a strictly limited exchange, perhaps destroying one or two major cities and or military targets. It is reasonable to assume, in such a scenario, that belligerents would not target their respective capital cities. The whole notion of limited warfare collapses if the opponent is decapitated and unable to concur in a truce and restrain its own forces. Therefore, although localized devastation may be total, with major loss of life and property, the primary institutions of government and finance may be assumed to survive in recognizable form.

The contemporary US economy is, therefore, the baseline for this scenario, as it is for those of greater destructive impact. However, the more traumatic disruptions of the worse cases are expected to reduce the number and complexity of surviving markets. The best case retains the diversity of non-market and market structures exhibited by the existing economy.

Clearly, it is impractical to attempt a description of each market in the US according to type of product or service. Instead, we concentrate on recovery in the disaster area and some of the effects that may occur in the economy within this area. However, we point out that all of the exchange structures can be found in various degrees in the US economy, although subsistence and peasant marketplaces play only a limited role. Thus, some of the more general interactions between exchange structures and formal US institutions are discussed in the section on the necessary and facilitating functions of exchange activity.

Analysis of recovery within the disaster area is subject to the arguments made in chapter one, where it was pointed out that the level of devastation may be so great as to exceed the combined emergency resources of the entire US. However, our interest lies primarily in the period following the initial emergency period, what is more appropriately thought of as the reconstruction period.

6.1 LEVEL AND SCOPE OF THE RECOVERY EFFORT

Reconstruction in the disaster area may fall under three cases. First is the case where the damage is so great that the rest of the country decides, explicitly or implicitly, not to offer any assistance for the reconstruction of infrastructure or resources. In effect, the area will be treated as if it does not belong to the rest of the US economic, legal or political systems and thus, restoration of social order and resource development within the area is expected to proceed along the lines of the worst case scenario. However, this is not a very likely case because such neglect is inconsistent with past disaster

relief actions and would likely be politically unacceptable to the surviving population.

In the second case, the outside system may restore the major components of the institutions, such as a legal system and agencies to enforce civil order, but decline to offer reconstruction relief in the way of subsidies to reduce the cost of attracting or developing commercial resources. This case is more likely than the first, especially if the disaster has already imposed a tremendous burden on the rest of the economy to pay for emergency services. Where institutions are restored but resources are left largely in a devastated state, it would appear that we have the conditions for the institution intensive scenario and the reader is referred to chapter nine. The stability of market structures to bring about economic recovery would be very dependent on the level of conflict between area groups and the established authority.

There is, however, one important difference between the case just described and the institution intensive conditions discussed in chapter nine. In the institution intensive scenario, resources are scarce throughout, including those that the institutions need to maintain and to enforce authority. This will not be true in the best case, where outside resources can and probably would be used in attempts to maintain the authority of the outside system. This would not alter many of the authority-maintenance problems. In fact, it may simply exacerbate the damages (social and physical) by prolonging the period where each side has the capability to engage in conflict. An example of this kind of phenomenon is the clash between law-enforcement agencies and inner-city groups (Libman-Rubenstein 1979).

Finally, relief programs may be implemented to assist both institutional and resource development. This case would correspond to the general pattern of relief actions following many localized disasters, and thus, suggests the most likely decision of the outside sources of aid.

6.2 ECONOMIC RECOVERY WITHIN THE DISASTER AREA

Hill (1987) provides an extensive review of the analyses that address the economic recovery question from regional disasters. In general, he finds that recovery resources do not benefit all groups equally. An understanding of the exchange repercussions requires a distinction between groups that are included in the recovery program and those that are excluded.

6.2.1 Exchange Structures of the Groups Included in the Recovery Programs

One of the more important conclusions of the Hill (1987) review of the literature is that the local disaster produces almost no negative long-term effects on the local economy and, in fact, may result in a net positive effect. This result is produced in most of the studies that

Hill examines. Further, he finds that the studies support the proposition that there is little effect on the availability of resources once outside sources begin to augment the damaged resource base. Six major considerations that will affect exchange activities in the recovery area include:

- o A major source of the aid to the disaster area comes from the inflow of funds and technical assistance provided by federal and state agencies. Thus, the relief programs stimulate new construction of production facilities as well as an opportunity for owners of existing establishments to improve their facilities. While the inflow of funds is clearly a factor in the recovery success, one question that was not addressed by Hill is the possible influence of changes in the underlying market structures.
- o There are several aspects of the relief programs that suggest that the rules of the dominant market structures are altered. For example, studies show that, immediately following a disaster, community networks emerge to deal with emergency and recovery activities. In addition, the community networks may enhance market power on the demand side of the market, thus, there may be some downward pressure on prices from countervailing market power.
- o After the relief effort is underway, the environment may become purged of many of the inefficiencies of local monopoly, oligopoly, or imperfect competition in the process of allocating the relief funds, especially in the face of long-standing supply networks. If the old rule for pricing followed a posted-price (or fixed price) scheme and the new rules imply competitive bidding for agency funds, then we would expect an improvement in efficiency. Plott (1986) argues that this result can be expected where the posted-price system encourages price leaders and followers.
- o With the relief funds and the need for new resources in the area to undertake the reconstruction activities, new firms should enter the market that are not part of the old network. Thus, a new market structure would emerge with rules that invoke greater competition among the suppliers, perhaps as a move from an oligopolist structure to imperfect competition.
- o Another likely change in the rules results from the lower private information costs where government agencies undertake information collection and distribution activities. This has the effect of not only increasing the information flows within the disaster area, but also for the outside economic system where information is costly. Furthermore, with the greater access to funds and public-agency encouragement, the risk of starting a new business in the disaster area is probably reduced as well. Greater information flows and reductions in uncertainty will both be conducive to the use of more competitive rules.

- o Resources may be removed to the non-formal sector by groups largely excluded from the recovery program.

These six factors suggest that improved economic performance, or at least, the absence of long-term economic impacts, may be due partially to changes in the underlying rules of formal and informal market structures and the inflow of disaster funds. However, it is puzzling that these changes do not produce dramatic or permanent effects for the disaster area. Two causes why the performance improvements may be dampened are the reversion of the rules to less competitive structures over time and the removal of some resources from the formal market structures.

First, reversion of the rules to less competitive structures could result if there are real, transaction-cost factors underlying the less competitive rules as suggested by Williamson and others. These factors would begin to appear again as the relief efforts subsided and removed their beneficial influences on price setting, information, and risk. Secondly, the fact that not all groups will have equal access to the relief programs will encourage them to seek out other channels for their exchange activity, and they may remove their resources from the formal market structures.

Finally, it is possible that the local-recovery program has no significant effect on the local economy other than perhaps causing a short-term flurry of construction activities. In other words, government intervention causes a short-term boom to the local economy, but over time, the level of economic activity recedes to its pre-disaster level. In this case, once the subsidies are removed, there may be little permanent change in the economic performance of the area. However, it remains to be answered why the local economy does not sustain at least some of the gains from having older facilities replaced with new facilities.

6.2.2 Exchange Structures of the Groups Excluded From the Recovery Programs

The American economy is no exception to the observation that most societies have several interrelated and overlapping systems of exchange (Bohannan 1955, Polanyi 1944, Davis 1972). We actually live in a multi-centric economy in which formal market structures co-exist with many sub-economies.

Ferman and Ferman (1973) have pointed out that modern industrial society produces conditions that provide fertile ground for this development. Ethnic and cultural distinctions, and an unequal distribution of wealth and income create economic categories of people that are largely excluded from the formal economy. The formal sector fails to provide goods and services for these excluded groups at prices they can afford because it is burdened with high transaction costs including costly mechanisms for regulating standards of production and distribution. For example, economic specialization resulting from the demands of a complex technological system that requires high degrees of

technical expertise, together with the growth of protectionist trade unions and professional associations, coalesce, so that some goods and services are not widely available or are too expensive for large sectors of the population (Robinson and Henry 1977). These same factors exclude many people from jobs in rewarding areas of employment (Ferman and Ferman 1973).

The result of these exclusions and failures is to provide a context for the emergence of a range of intimate and associational structures for low-cost or unavailable goods and services. In fact, any disaster-recovery effort, while attempting to restore the foundations for economic growth, may also exacerbate the gap in access to resources for low-income or disadvantaged groups when entry rules to either supply or demand are altered. Thus, constraints on resource mobility, especially the labor resource, may be worsened by relief efforts that do not account for the resource needs of these groups.

6.3 FUNCTIONS

Having outlined some important features of the disaster economy in the case where outside aid is available for reconstruction of infrastructure and commercial activity, we expect to find all of the exchange structures implied by the modern US economy in varying degrees. These structures would include all of the non-market and market exchange structures discussed in chapters four and five. Further, we would expect the subsistence exchange structure, the peasant marketplace (as found in open flea markets), and prestige types to play only a limited role.

We can now consider to what extent available exchange structures and formal institutions perform the basic functions constituting exchange activity outlined in chapter one. In this way, we can illustrate which market structures are sufficient on their own to generate what we commonly regard as business as usual, and which structures rely heavily on extra-market institutions to function at all. To highlight this point, we first discuss the role the formal institutions in the US in performing the functions, and then consider the role of particular exchange structures. As each function is examined, it should be noted that the underlying interest throughout refers to the extent that the function is performed by the exchange structure, unimpeded by additional extra-market regulations.

1. Define property rights. In best case scenario, property rights are defined by laws rooted in custom (common law) or enacted through legislation. Certain property is governed by common property rules, e.g., oceans, airspace, but most property is subject to the rules of private property. Ownership is legitimated through possession, documents proving legitimate acquisition (receipts), or registration with a regulatory or local governing authority, e.g., county clerks.

Only the intimate exchange structure and the criminal variant of the associational market can be said to include

rules that define explicitly property rights in a way that does not rely on the extra-market legal system. In the former case this is accomplished through the conditions imposed on network membership with respect to the right to use and manage. In the latter case, this occurs through property that is illegal in the external system. Formal markets take property rights as given from the extra-market legal system, however, they may define the means by which property can be transferred, as with any good that can be exchanged. Furthermore, these markets can affect the distribution of property rights since the value of the rights is usually a market outcome.

2. Convey supply/demand information. General economic information is conveyed through formally constituted exchanges such as stock and commodity exchanges. These institutional channels of information are supplemented by the news media, government agencies and publications, and the advertising media.

The intimate, associational, perfect competition, and imperfect competition market structures fulfill this function to meet the desires of their trading agents. Information is transferred quite frequently and uniformly through either network rules underlying face-to-face interactions or the price signal. As market power becomes more concentrated in the less-competitive structures, traders may establish rules that reduce the flow of information to retain secrecy and limit the entry of potential competitors in the market.

3. Provide opportunity for legitimate transactions. For goods that are non-exclusive in consumption, i.e. public goods like police and fire protection, this function is performed by local and federal government agencies. By providing these services, the agencies effectively create the opportunity for traders to purchase them in the absence of their provision by the private markets. For private goods, this function is performed largely by the extensive network of wholesale and retail outlets in the US economy. At times, government intervention is used to expand what coexist as private opportunities by undertaking commercial activities such as the provision of electrical power (Tennessee Valley Authority) or educational services.

The rules in the formal market structures imply that increasing degrees of market power, and thus, decreasing degrees of competition, should act to limit the opportunities for legitimate transaction. In the non-market structures, membership is likely to be motivated by a desire to expand the opportunities for and/or gain from exchange relative to those obtainable in outside structures.

4. Limit provisions of legitimate contracts. In the first instance, the provisions of legitimate contracts are limited

by state and federal law. Legislatures and courts outlaw exchange of certain goods and services, e.g., sexual services, children, endangered species, and limit others, e.g., pharmaceuticals and explosives. Market institutions also may limit contracts, e.g., insurance contracts, but may rely still on regulatory agencies and the courts to enforce compliance with the limitations.

In the non-market structures, this function is performed by the rules of the network, or in the case of the criminal variant of the associational market, by the rules of the criminal corporation. In the formal markets, limitations that are additional to those of the extra-market legal and regulatory system would stem from an inequality in market power or market failure. Because of uncertainty or the presence of externalities, suppliers may be unwilling to offer a complete set of contracts to demanders because they are too risky or do not adequately compensate suppliers for their efforts.

5. Enforce contracts other than by physical coercion. The enforcement of contracts is carried out largely by the legal and regulatory systems and through the use of sanctions. These sanctions include expulsion from the activity, e.g., revocation of a license, fines, and imprisonment.

All the exchange structures also imply some enforcement of contracts. However, the nature of the enforcement changes from social pressure in the non-market exchange structures to monetary penalties in the formal markets. In the less competitive markets, enforcement of contracts can be initiated by the withdrawal of payment or supply.

6. Settle disputes. This function largely will be performed by the state and federal court systems. Private and public mediators may also assist in the settlement process between parties in a dispute. In addition, religious institutions, regulatory agencies, and private associations often engage in dispute settlement where disputes arise among their members or between their members and outside groups.

An exchange structure may perform dispute settlement continuously where there is negotiation after consumption, as in the intimate market or where prices are subject to negotiation after consumption has taken place, e.g., formal market exchanges with continuing contractual obligations. However, these adjustments require that parties can be identified cheaply so that negotiated compensation is possible.

7. Maintain civil order. The institutional responsibility for civil order operations resides with the state and federal lawmakers. Their decisions are enforced by the courts, police, and in times of emergency, the military. The intimate

exchange structures and criminal variant of the associational market are the only two structures with rules that do not rely almost entirely on these extra-market systems to maintain civil order among their members. In the former case, the network rules preclude relying on the outside system. In the latter case, traders simply do not have the option because trading networks exist outside the protection of the formal legal system.

8. Legitimate other functions. This function is carried out by Congress and state legislatures for society at large and by the governing bodies of institutions such as stock and commodity exchanges, corporations, and professional associations at the micro level.

The intimate exchange structure attempts to use its network rules to legitimate other functions, like a society within a society. In the market structures, enforcement and pricing are legitimated by the structure subject to approval by whatever existing governing body oversees the transaction activities. For example, functions may be legitimated by external legal or regulatory systems, e.g., the Nuclear Regulatory Commission, or internal governing mechanisms, e.g., the Executive Board of a corporation.

9. Guarantee currency and close substitutes. Currency is guaranteed by the US government with various responsibilities falling on the Federal Reserve Bank and the Treasury for all of the exchange structures in the best case. The value of close substitutes is established, but not necessarily guaranteed, by the primary market system for their exchange. The primary market and markets for authenticity activities may be internal or external to the exchange structure of interest.
10. Administer distributive justice, including taxation. This function is determined primarily by federal and state legislatures and charities. Policies determined by these institutions are executed by regulatory agencies, the IRS, state and local tax officers, and charitable organizations.

The intimate exchange structure is the only structure where redistribution, over and above the formal-institutional programs, will be attempted by rules affecting the haves and the have-nots. In the associational, perfectly competitive, and imperfectly competitive markets, there will be a tendency to maintain the status quo because they are near the point of balanced reciprocity. In the formal markets where market power is pervasive (e.g., monopoly and oligopoly) or the criminal variant of the associational structure there will be a tendency to reallocate from the have-nots to the haves. Taxation in an explicit rule to redistribute wealth among members of the social network, occurs only within the intimate and criminal structures.

11. Monitor and modify operations in response to changing circumstances. At the federal and state levels of government, this function is performed extensively to respond to the needs and demands of various constituencies. Monitoring and reporting information is a major function of many public agencies, since information is often treated as a public good. For example, the US Department of Agriculture regularly monitors and reports information about changing market conditions, technology, or price expectations to reduce informational transaction costs and assist traders in modifying their operations.

In addition, monitoring and modification of operations is performed independently by all of the exchange structures to various degrees. In perfectly and imperfectly competitive markets, this function is accomplished by the rules fostering competition among traders. Suppliers that do not respond to changing circumstances are not likely to stay in business very long given the price taking position of traders and the minimal excess profit levels. In markets with greater concentrations of market power, how well this function is performed depends on suppliers' expectations regarding protection of their market shares. Where rivalry is great, suppliers are likely to invest heavily in research and development and monitoring activities (Stiglitz 1986). Where the threat of competition is small, the supplier is likely to ignore changing conditions and be reluctant to modify operations.

12. Mitigate risk. In the best case, public and private insurance institutions are principal institutions for mitigating risk. Regulatory controls also act to limit risks by restricting risky activities. For example, the Federal Deposit Insurance Corporation combines an insurance mechanism with regulatory controls on savings deposits to mitigate the risks of bank failures. Risks may be partially mitigated for some groups to increase their willingness to take risks, e.g., the limitation placed on nuclear-power operators' liability under the Price Anderson Act.

In the intimate and associational exchange structures, the social and network rules are relied on to insure members against the cost of risks. In the formal markets, risk is mitigated through an associated insurance market, by rules controlling input and output resources (mergers), or the diversification of production or consumption activities.

13. Exploit comparative advantage, specialization, and division of labor. The formal institutions perform this function in the same sense that they expand the opportunities for legitimate transactions. Encouragement of certain activities to develop a new industry, provision of information or educational programs, and interregional commerce commissions are all means

of supporting the diversity of goods and services in the economy.

All of the market exchange structures exploit comparative advantage, specialization, and division of labor as responses to profit incentives. This result derives directly from the primary reliance of the rules on demand and supply conditions to allocate and to distribute goods and services. In the intimate exchange structure, there is an attempt to prevent specialization in labor since this goes against the consumer as producer philosophy. If members are too specialized, then their services are not interchangeable, a condition that is not consistent with the process of maintaining group cohesion.

14. Reduce transaction costs for intertemporal or interregional transactions. Formal institutions perform this function by increasing the availability of credit, e.g., Small Business Administration, decreasing uncertainty through the provision of information, e.g., leading regional indicators, and price stabilization, e.g., Federal Reserve Board control over the money supply to stabilize interest rates.

In the intimate exchange structure, intertemporal costs are reduced by the rules fostering delayed reciprocity, which is analogous to credit. In the formal market structures, intertemporal and interregional transaction costs may underlie the sustainability of the structure. For example, firms may lower interregional transaction costs by conducting business activities through a network of wholly or partially owned subsidiaries. Such rules increase the degree of market power but lowers their production costs.

6.4 CONCLUSION

From the discussion above, it appears that intimate structures are very self-sufficient, with one great flaw: they rely on the external system for many of their needed goods. In the recovery area, the intimate and associational structures may initially play a very important role, but once reconstruction is under way, their roles should diminish relative to the formal market structures. This transition is likely because of the preservation of institutions that currently support market activities. Thus, we expect property rights and the use of currency and credit in the recovery area to be restored quickly to the procedures used in the current US economy.

Government restoration programs in the recovery area are likely to be aimed at encouraging the perfectly and imperfectly competitive market structures. There may be an increase in the competitiveness in the region due to the inflow of restoration funds and government efforts to reduce transaction costs. However, according to the empirical studies of disaster-recovery areas, supply and demand improvements do not persist over time.

Outside the recovery area, exchange activities are likely to be conducted as they were before the disaster with most economic transactions taking place in imperfectly competitive or oligopolistic markets. The fourteen functions illustrate how interdependent these markets are with the myriad of formal institutions in the US. In fact, without the support of the formal institutions, many of the existing markets would fail to operate or, at least, would be far less extensive than they are currently.

7. THE WORST CASE

In complete contrast with the best case, the worst case scenario is based on the assumption that resources sustain extremely heavy damage and the institutional framework of society is, for all practical purposes, completely eliminated. In the event of a massive combined counterforce and countervalue strike, this state of affairs might pertain to much of the United States.

If devastation is less than totally uniform, the worst case is likely to characterize the state of affairs in those areas where the population survives but direct extensive material damage is sustained. The worst case also may apply to areas which had relied previously upon resources and government direction from other parts of the country that have been destroyed or cut off by the attack. Hence, the worst case is distinguished from the institution intensive scenario, where government and financial institutions survive effectively in areas of low resources, as well as from the scenarios where resources are plentiful. However, the worst case may exist in some parts of the country at the same time that the institution intensive and resource abundance scenarios pertain elsewhere. It is presumed that worst case areas are, at least initially, isolated from better off communities, and are unable to call on the institutional or physical resources of these other areas. However, where such contact eventually occurs, civil conflict may occur due to the difficult nature of social organization that is described below.

Of course, the worst case is unlikely to coexist with the best case, as the central government would immediately declare a state of emergency in a single stricken zone, and rush to provide material and institutional aid to maintain civil order.

It may be worthwhile to remind the reader that the worst case is defined to be exactly that. If sufficient institutional infrastructure survives at national, regional, or local level to preserve the peace and security of civil society, then we have either the best case or the institution intensive scenarios, depending on the level of surviving resources. If the reduction in population is such that the surviving resource base, although diminished, provides per capita plenty, we have the resource abundance condition, not the worst case.

7.1 LIFE WITHOUT CIVIL SOCIETY

Some readers may find the worst case unthinkable, therefore unrealistic. But, however unpalatable, it is thinkable and therefore, although unlikely, it provides a logical bounding condition for survival and subsequent economic recovery. In this extreme scenario more than any other, the loss of institutional continuity and customary patterns of social organization combine with extreme competition for resources to make the survival of practical pre-attack values and expectations of

consistent human behavior highly unlikely. This is in accordance with our argument about the vulnerability of so-called core values in chapter one.

The loss of institutions is assumed to include the collapse of currency and the banking system. With no records of debt and property ownership, possession is likely to become the principal determinant of ownership. Pre-attack contracts, therefore, would be likely to fall into abeyance. The absence of law-enforcement infrastructure to uphold even rights of possession would exacerbate both the insecurity of property ownership and the risks of attempting to trade, already increased by the collapse of insurance and producer/consumer legislation. Monitoring, dispute settlement and enforcement would rest with individual traders or fall upon individuals and groups with the physical power to coerce.

The emergence of warlords, armed factions, dacoits, bandit groups, and so-forth is well documented in societies that have experienced the serious breakdown of the national institutions of civil society. Disaster-relief workers give many accounts of armed groups that are often the remnants of the very institutions that normally would be used to preserve order in emergencies and to maintain the conditions for the functioning of markets or orderly allocation of relief supplies (Stephenson 1986). Units of law-enforcement agencies and military regiments have been observed (eg. in Somalia, Uganda, and Kampuchea) to act as independent economic units, collecting their own taxes on the movement of goods and appropriating services (Heder 1980). Their strength relies partly on their possession of firearms, but also on pre-existing association and identification of common interests.

Similar phenomena have been encountered throughout the development of the United States, especially under frontier conditions that parallel those of the worst case in respect to the availability of resources and institutions of civil society. Take, for example, the activities of the notorious Judge Roy Bean of New Mexico (Sonnichsen 1986), whose self-interested interpretations and enforcement of the law ensured his own enrichment. The California gold rush produced individuals such as John Sutter who, far from the reach of the state authorities, levied taxes on miners working property to which he had no title (Umbeck 1976).

It may be objected that Sutter and his ilk differed from potential survivors in the worst case scenario in that the frontier men were attempting to carve out a society in a land where no Europeans had previously established the rule of law. According to this view, economic development does not parallel economic breakdown. Survivors of nuclear war, it may be thought, will attempt to reaffirm the rules by which they lived before. Unfortunately, the objection is not compelling. The men and women who built the frontier society came from places where the rule of law was just as well established as in pre-attack America. By no means all were misfits or fugitives who rejected the institutions of the civilized east. If all that were necessary for continuity in the effective rule of law between eastern city and the western frontier was that the values of civil society were carried in the heads of individual settlers, why could they not carry them across?

space just as effectively as our critic would have them carried across time?

The answer is that for values to become effective requires an appropriate institutional framework. Eventually, such a framework diffused from east to west across the United States. In the meantime, the institutions, like kinship, that did move with the settlers frequently substituted for the functions of civil society. At the family level, clan leaders like "Devil Anse" Hatfield and Judge James Hargis emerged as family enforcers around whom feuding groups, loosely tied by bonds of kinship and marriage, rallied for protection (Harris 1940, Jones 1948).

If, by definition, the institutions of civil society are eliminated in the worst case scenario, we must ask what could take their place. Generally, we suspect that the family will be an important model for many of the survivors. In the long term, such survivors should be able to develop appropriate institutions of civil society. In so doing, they, by definition, will lift their communities out of the worst case scenario. In the shorter term, however, survivors may have to contend with some less attractive options. For instance, survivalist groups in rural areas and territorial urban street gangs may be well adapted to step into the power vacuum left by the elimination of effective formal institutions that defines the worst case. Thus, it is reasonable to suppose that the worst case scenario would provide conditions in which the criminal variant of the associational exchange structure may flourish.

However, as Hobsbawm (1969) points out, not all banditry is motivated purely by personal gain. The phenomenon of social banditry, where goods are expropriated from unwilling owners for distribution among the wider population has been found in diverse times and places from the medieval Robin Hood to the James Gang of frontier America. Jesse and Frank James gained a strong following in Mid-America after the Civil War, for their activities against the unpopular banks and railroads (Settle 1966). More recently, neither the Mafia nor the Carabinieri para-military police were equal to the challenge of Salvatore Giuliano who exerted control over rural areas of Sicily in the years immediately following the second world war (Hobsbawm 1969).

Gang leadership is likely to be a major outlet for entrepreneurship of a certain sort. Other kinds of enterprise would be opened up by the removal of pre-disaster institutions and interregional markets, alongside a wholly changed demand/supply environment. However, the profit opportunities would have to be extremely large, relative to investment, to compensate for both the economic risk of coordinating resources and the personal risk of having them expropriated by coercive threats or force (Knight 1921). Indeed, a likely cost to an individual or community attempting to meet agricultural or manufacturing demands will be that of security, whether this is incurred by hiring mercenaries (pace the Seven Samurai) or by organizing, training, and maintaining an armed militia. Citizens wishing to protect themselves from predatory gangs and who are unwilling to accept the patronage of social bandits may well choose the collective self-help option of organizing their own

defense. However, the problems of egalitarian cooperative organization have been well documented (Olson 1965, Henry 1988). This option is likely to be facilitated by the charismatic leadership of individuals possessing the gifts of inspirational rhetoric and organizing skills to establish effective vigilante groups.

The vigilante solution to the problem of maintaining civil order where the formal legal institutions are weak has been a ubiquitous feature of American history. The first recorded indigenous American vigilante movement occurred in South Carolina in 1767 as a response to the problem of maintaining law and order far from the centers of effective government jurisdiction. It was a pattern repeated time and again beyond the Appalachians, culminating in vigilantism's most famous failure, the Wyoming cattlemen's regulator movements that precipitated the Johnson County War of 1892 (Brown 1979).

An alternative source of dispute settlement may develop around charismatic holy men, corresponding to the Swat Pathan saints described by Barth (1959). Leaders of rival groupings may recognize that the transaction costs of settlement through violent confrontation are bound to be high. If the followers of A and B kill each other off in a feud, both parties may be weakened in respect to a third contender. Powerful leaders may, therefore, prefer to submit disputes to some form of arbitration by a normatively disinterested third-party who derives authority from sacred, rather than secular power. Another source of arbitrating authority may come from the possession of technical skills that confer power over natural resources, rather than from coercive power over individuals or groups. In either case, physicians and priests, for example, may well prove capable of maintaining a market peace free from intervention by rival parties who rely on the arbitral powers of these individuals. Peasant-marketplace exchange structures may, therefore, emerge.

Arbitrators are not the sole alternatives to violent confrontation. Large-scale exchanges of prestige goods and competitive feasting are examples of "Fighting With Property," (Codere 1950) that have supplanted warfare in places as diverse as the American Northwest Coast and Papua New Guinea (Strathern 1971). This activity is paralleled in nineteenth and twentieth century America by the competitive philanthropy of robber barons and multi-millionaires, who enhanced the power and influence of their families by establishing the foundations and endowing the hundreds of university chairs that bear their names. Hence, the prestige exchange structure is likely to be highly significant in establishing a pecking order for dispute settlement between individuals competing for leadership roles either in gangs or in self-protective communities.

The bandit, brigand, or dacoit gang may be an important unit of consumption (by appropriation) and of exchange, through both prestige and criminal markets. It also may be a provider of military or security services and a regulator of economic activity through taxation and provision of a market peace. Thus, peasant marketplaces may emerge under the patronage of an enforcer (as well as an arbitrator) who is capable of maintaining civil order and arbitrating smaller disputes among traders. However, in all of these cases, the principal unit of

production is likely to be the extended family (including people treated like kin) which will account for the exchange and consumption of subsistence goods through intimate and associational exchange networks.

Hence, it certainly is not the case that all exchange under the worst case scenario would be subject to coercion. Neither would all contracts be enforced through threats of violence. However, the true free market does not seem to be an important option here since most exchanges will be conducted according to socially defined webs of obligation that will hold together the self-protective community just as surely as they bind the charismatic leader to his followers.

The risk-reducing benefits of intimate and associational trading relationships will be especially appreciated in a climate of high uncertainty (Mintz 1961). Such relationships are likely, therefore, to encourage preferential trading partners in the peasant marketplace, which seems to be the closest to the free market that society can hope to aspire while the worst case conditions apply. Until conditions improve such that the worst case bounding conditions are alleviated, preferential trading relationships seem likely to be maintained despite the danger that this may result in a decline in the quality of goods traded (Wilson 1980). In summation, subsistence, prestige, and peasant-market exchange structures, all heavily influenced by intimate and criminal associational exchange, are likely to displace almost, if not all, formal market activities in the event that the worst case is realized.

7.2 HIGH RISK AND SCARCITY

Subsistence production under the worst case is not likely to be "the original affluent society" that, as we noted in chapter four, Sahlins (1972) ascribes to the Kalahari Bushman. It may be that Bushmen have adopted a "zen road to affluence" by restricting wants to that limited range of resources that is plentiful in the desert for those with appropriate skills. We may be able to emulate a Bushman restraint on wants under the resource intensive scenario where certain goods are abundant. However, despite superficial similarities arising from the narrow variety of resources available to both Bushmen and worst case survivors, other factors render the comparison tenuous.

For the Bushman, restriction of wants depends upon living where other groups do not put competing pressures on resources. True, where others see only desolation in the desert, the Bushman may see wild orchards and abundant game (Lee 1969). But this was not always so, Bushmen have learned their ability to extract plenty from scarcity because stronger groups forced them out of places where nature's bounty is more obvious. Bushman affluence depends upon acquired skills and restricting populations, as well as upon their former persecutors not following them into the desert to compete for its simple fruits.

The worst case instantly places everyone in the desert competing for what resources remain. There will be no transition period and no time to acquire new skills to extract plenty from scarcity and to learn

to view the world of goods in a new way. Rather, the initial phase of the worst case is likely to be an undignified scramble for surviving resources to sustain life in the short term. This will be accompanied by the formation and dissolution of shifting alliances between individuals and groups, as community stalwarts, former politicians, religious leaders, entrepreneurs, criminals, policemen, and military units vie with each other to establish control over local populations.

The first priority of worst case survivors is likely to be salvage; finding shelter, uncontaminated food, water, medications, tools, and weapons. As the extent of devastation becomes clear, and it is realized that there will be no foreseeable external relief, the initial urge to scavenge probably will expand beyond goods necessary for immediate survival to include items that may be useful for future barter or for modification to other uses as new skills are developed.

However, the quantity of surviving resources thus assimilated probably will be limited to those that can be carried by persons, beasts of burden, or on handcarts. Where electromagnetic pulse (EMP) has not rendered motor vehicles inoperable, gasoline supplies (according to our definition of resource destruction) are likely to be extremely limited. A further limitation on stockpiling by individuals, groups, or communities will be the necessity to defend acquisitions from seizure by others. This will provide the motivation for ordinary citizens to organize vigilante groups or to seek membership in gangs, or the protection of enforcers.

The initial phase of extreme competition for surviving goods is likely to be limited by their finite supply. Those that are durable may enter the prestige sphere and be used in dispute settlement or to pave the way for the trade of non-prestige goods between rival groups (Malinowski 1922, Singh Uberoi 1962). Survivors probably will soon develop a domestic mode of production, adapting remaining artifacts to new uses and learning new skills for subsistence agricultural production. The domestic mode of production, combined with the vulnerability of civil society is likely to yield six major problems for exchange within the worst case scenario.

- o The collapse of currency and scarcity of surviving resources will drastically reduce purchasing power. Scarcity of agricultural and domestic productive capacity will lead to dramatically escalating relative prices for food. Prices, initially, would be only a means of communicating comparative value, no money would actually change hands since barter, or currency substitutes such as precious metals, may completely displace cash transactions. Items and quantities exchanged soon are likely to replace cash equivalencies as indicators of value.
- o Initially, demands on surviving resources will escalate, as these are consumed for short-term survival. As conditions improve, rising demand may continue as traditional technologies are adapted to replace lost raw materials or productive capabilities and new skills are developed. Credit,

within a barter economy, is likely to prove problematic given the high uncertainty of the worst case environment. Where long-term trading relations are established between preferred trading partners and where prestige exchanges develop between leaders or communities, credit will be available, but it is unlikely that there will be an open market or general use of credit among traders.

- o Given the loss of vital resources, there are likely to be binding time constraints on all production and exchange activities in order that the surviving population can assure its own survival.
- o There is likely to be an abrupt shifting of demand and supply as supplies are damaged and preferences altered by the disaster. Market power balances may be shifted decisively, as goods once valued and representative of wealth are reevaluated. Their owners may be instantly poor while others, particularly those with coercive power or skills essential to survival, become wealthy and powerful.
- o The loss of population, destruction or unavailability of records of property ownership and loss of the institutions to enforce pre-attack contracts, also may lead to dramatic changes in the distribution of wealth as debtors are freed of their obligations at the expense of creditors.
- o The resultant free-for-all is very likely to produce considerable conflict based on perceived injustices and the scramble for control of surviving resources.

7.3 FUNCTIONS

Under the worst case scenario, the subsistence, peasant-marketplace, criminal variant of the associational and prestige exchange structures may fulfill the necessary and facilitating functions of a market. In describing the mechanisms that accomplish those functions, it is appropriate to consider the institutions available or creatable to operate the mechanisms. Clearly, under the worst case scenario, the ability to perform functions will depend upon: (a) the transferability of functions from destroyed institutions; (b) the perceived legitimacy of the functions and of any institutions established for carrying them out; and, (c) the time taken to adapt mechanisms and develop alternative institutions for the performance of the necessary functions. These are dealt with below.

1. Define property rights. The scarcity of resources and destruction of infrastructure render it questionable that pre-attack patterns of land-tenure will survive. Possession of land and the power to protect it may prove to be the criteria of ownership for agricultural production. Subsistence production/consumption units probably will be able to farm as

much land as they have labor power within the family unit as extended to include close friends and their kin.

The subsistence structure is so closely dependent on membership of a multi-purpose social group that rules governing shared property rights actually constitute major social bonds. Internally, therefore, there is no need for an extra-market legal system and rights will be defined and enforced internally by kinsmen and coresidents. Externally, property rights probably will be enforced by vigilante groups or gangs, although neutral mediators (such as religious leaders or doctors) also may participate in their definition. Personal private property is likely to be very limited in scope.

Similarly, property rights in the prestige structure depend strongly on custom and kinship. Violators of rules defining these rights are excluded from transactions by other members of the market. However, in some cases, extra-market sanctions may be brought to bear by enforcers to decide disputes over property by force of arms.

Property rights in the peasant-marketplace structure probably will be defined through the development of customary rules interpreted by community or gang leaders, who allocate disputed resources, and market patrons (sometimes the enforcers, but also religious figures, guilds, etc.) who maintain the market peace. These are extra-market mechanisms.

2. Convey supply-demand information. The subsistence and peasant marketplace structures effectively convey information. The subsistence structure does this through intimate face-to-face interaction, while the peasant marketplace structure brings traders to a common marketplace, precisely to reduce information costs. The prestige market structure provides motives to restrict information since the object is to effect status-enhancing exchanges, usually at the expense of rivals (Codere 1950, Strathern 1971).
3. Provision of opportunities for legitimate transaction. These may be provided by a variety of institutional mechanisms, primarily kin and friendship based trading networks. Also, certain sites such as churches or their remains might provide safe locations for trade with members of other such networks, especially if presided over by community leaders or holy men to keep the market peace. The purpose of peasant marketplaces is to provide transaction opportunities, reduce information costs, and mitigate risk.

Mechanisms such as blood brotherhood (Barth 1959) or patronage (Eisenstadt and Roniger 1984) might provide security for itinerant traders or those venturing into territory beyond the immediate community.

Exchanges internal to the production/consumption group are likely to be legitimated through rules that specify continuing social relations. Mealtimes may be the most formal occasion of exchange here. Just as in all exotic and industrial societies, religious festivals, rights of passage, weddings and anniversaries frequently are occasions for prestige prestations (Douglas and Isherwood 1978).

4. Limitation of provisions of legitimate contracts. In the subsistence structure, this is done by the rules of distribution within the production/consumption group. Peasant marketplace structures combine traditional trading patterns with the extra-market controls of landowners and market patrons. The rules of prestige exchange limit legitimacy in that system.

Within these broad limitations, the provisions of legitimate contracts are likely to be largely a matter of individual negotiation between traders, although customary rules of conduct and demands made by kin and friendship networks, churches, and community associations are likely to constrain the terms of contracts made within the group. Contracts with outsiders or members of other communities probably will be less constrained, except in the burdens placed on the whole network by the undertakings of a single member. If an individual defaults on an obligation, it is likely that his/her entire production/consumption unit will be called upon to make redress by the injured party's community group or powerful patron (Gluckman 1955).

5. Enforcement of contracts other than by physical coercion. Ultimately, the threat of coercion by the possessors of military force seldom will be far from the minds of major disputants. However, all of the exchange structures imply some sort of enforcement of contracts. The nature of enforcement varies from social pressure and shaming in subsistence and prestige structures, to a combination of the desire for repeat transactions and extra-market constraints from market patrons in peasant marketplaces.
6. Dispute settlement. There is only a very limited range of sanctions and appeals available in the worst case scenario. In subsistence and prestige structures, settlement is achieved by threats of exclusion as well as through shaming and ostracism. In peasant and criminal-associational structures, these mechanisms are supplemented by extra-market agencies. As stated above, the neutrality of holy men and their separation from the daily power struggle may be respected by parties to a dispute. Oracular mechanisms may be employed to make decisions without their attribution to human agency (Evans-Pritchard 1937). Another mechanism is contest, including fighting, tests of physical endurance, or the giving away of a valued endowment in the prestige structure. Settlement-directed talking (Roberts 1979), on the other hand,

might include third-party adjudication imposed by a judge or arbitrator, mediation by a go-between or holy man, and consensus formation through extensive debate (Rayner 1988).

7. Maintenance of civil order. The subsistence structure depends on the intimate relations of the production/consumption group to maintain civil order. This is also a strong factor in the prestige and peasant structures. Because of the weaker social bonds between exchanging partners in the peasant system, it also relies strongly on extra-market agencies, such as military leaders or priestly market patrons, to maintain market peace. Ultimately, civil order will depend on those who have the guns, whether they are community vigilante, entrepreneurial mercenaries, or former police and military units.
8. Legitimation of other functions. Subsistence structures legitimate all internal functions through their multi-purpose social relations. Social relations based on coresidence, kinship, or established trading relationships are also important in prestige and peasant marketplace structures. However social relations are supplemented by the extra-market control system. In the criminal-associational exchange structures, legitimation relies on the interplay of threatened coercion and promised protection from outsiders to the group.
9. Guarantees of currency and close substitutes. There are no currencies in subsistence structures. In the prestige structure, the prohibition on exchanging down prestige goods for subsistence goods guarantees their value as close currency substitutes (Bohannan 1959, Douglas 1967). In general, peasant markets use currencies that are either guaranteed by market forces (eg. precious metals) or else are externally guaranteed by extra-market forces, such as the state. By definition, the backers of fiat currencies are absent in the worst case scenario. Guaranteeing emerging currencies or substitutes therefore will depend, to some extent, on the existence of survivors with appropriate assay skills. Experience in Kampuchea and Uganda indicates a strong likelihood that gold and gemstones will emerge as currencies when paper money fails (Heder 1980). Some guarantor of authenticity will be required.
10. Administration of distributive justice. Subsistence structures administer distributive justice through sharing rules. Prestige structures rely on the needs of the status seeker to coordinate the accumulation of goods to exchange. Regressive distribution of resources will occur where communities are at the mercy of enforcers who levy taxes in exchange for protection.
11. Monitoring and modification of operations in response to changing circumstances. This function is performed by all of the exchange structures in the worst case. There is likely to

be a tendency for fixed allocational rules in both the subsistence and prestige structures to change slowest, once they have become established. However, the low level of resources suggests that many rules will have to be flexible or the groups will perish.

12. Mitigation of risk. This will depend primarily on information and risk spreading activities on the part of traders. In all four exchange structures, mitigation of risk is achieved by trading with established trading partners. Although not a requirement in peasant marketplace structures, small traders frequently display a preference for developing a limited number of steady customers to whom they give a small advantage (Mintz 1961). However, they avoid selling to only one customer in order to disperse risk (Scott 1976). Ex ante payments also are used to reduce risk in peasant markets. Peasant producers reduce risk by use of multiple seed varieties, farming on scattered strips, etc. Formation of multiple trading units, consisting of multiple households or communities, can distribute losses, but also will require a disbursement of gains from trade. Preference for a series of small transactions over a few large ones may increase transaction costs but reduce the size of potential losses through default of payments, fraud, or short-term price fluctuations.
13. Exploitation of comparative advantage, specialization, and division of labor. These do not exist in subsistence exchange structures. In prestige and peasant structures, there is a clear tendency to exploit such differences where possible, however, traditional patterns of work and low levels of technology constrain this possibility. Where it occurs, exploitation of specialization is likely to depend upon what skills survive. Those who are in a position to enforce civil order or provide medical care, for example, may be able to extract a premium in transactions, even when they do not directly involve use of those special skills. This is a form of credit used to create long-term obligations that make goods or services more widely available.
14. Reduction of transaction costs for intertemporal or interregional transactions. Fixed allocation rules reduce transaction costs in subsistence structures. Where the imperative is to feed every group member and maintain group cohesion, haggling over who gets what is counterproductive. Peasant marketplaces reduce transaction costs by seeking to reduce information costs. Prestige exchange structures reduce information costs by public display associated with wealth transfers. However, transaction costs associated with interregional trade will be largely a function of those maintaining civil order. Payment of protection money or tariffs to enforcers will be one way to reduce transaction costs by mitigating risks of attack or theft. To the same

end, blood-brotherhood institutions could be instituted between itinerant and resident traders.

7.4 CONCLUSION

The definition and maintenance of property rights under the worst case seems likely to be extremely problematic. Whilst participation in subsistence production and consumption may be predicated on kinship and close friendship, the ultimate enforcers of the collective property rights of the subsistence group will be those who command the resources of the prestige sphere and those who control the peasant marketplace by virtue of military strength.

Currency will be displaced by barter for everyday exchanges of subsistence goods. Within the production/consumption group, equivalent values are likely to be established as a system of fixed allocations, perhaps initially based on perceived special needs of children, or on bonds of affection to the elderly. In the peasant-marketplace exchanges, values will be established through negotiation according to supply availability, transaction costs, and demand. Currency is likely to be confined to the prestige sphere, or for obtaining particularly lumpy goods, and probably will consist of precious metals and gems.

Major shifts in demand and supply are likely to result from the prevalence of worst case conditions. There will be a strong incentive for communities voluntarily to restrict the range of wants among members in order to avoid the disruption of demands that cannot be satisfied. In chapter four we referred to the social methods of income leveling and restraints on conspicuous consumption among West Yorkshire coal miners in order to maintain the cohesion of the community. The pressures on subsistence groups to eschew activity that might divide one section of the group against another are likely to be even stronger under the worst case than they are in contemporary England.

Hence, prestige activity is likely to be coordinated by enforcers or other leaders who are able to provide non-divisive incentives (a share in his prestige) for subsistence groups to cooperate in the provision of public goods. For example, Pospisil (1963) describes how only the prestigious big man could persuade his fellow Papuans to collaborate in the construction of a bridge, and how each villager retrieved his own logs from the structure when it fell into disrepair after the big man's influence had waned. The coordination of labor for large collective projects is likely to be a major obstacle to economic development from the worst case, especially where middle men are dependent upon enforcers for protection at the same time as their opportunities are limited by the prevalence of fixed allocations of goods.

8. THE RESOURCE ABUNDANCE SCENARIO

The resource abundance scenario is based on the assumption that endowments, comprising both material resources, such as machinery and goods, and non-material resources, such as skills and knowledge, survive a cataclysmic disaster. However, the overall industrial infrastructure, which we take to be the system of social and political institutions whose functions facilitate existing demand/supply transactions, is heavily damaged. Thus, the institutions which interacted with the market structure in the best case scenario are largely removed except at the local level. As Katz (1982) says, in describing one possible route to such a disaster, currency will be worthless and the banking system will collapse, leaving no means for borrowers to pay debts. There will be no insurance system, and only local records of stock certificates and property ownership. Even where records survive the corporate entities to which they relate, probably will be beyond the reach of surviving communications or have ceased to function.

However, despite this loss of national and regional institutional infrastructure, we assume that a high level of resource survival will be associated with the preservation of local institutions including, town councils, church congregations, voluntary organizations, and the kinship structure. Under these circumstances, it is likely that existing property rights will be preserved if the owner is a member of the community. Property rights may be reallocated by survivors where owners are anonymous to the community either because they live far beyond the reach of surviving communications abilities or because they are large corporations that were part of the national institutional structure that is now, by definition, defunct. Where non-owners already occupy such property as renters or managers, possession is quite likely to become the criterion for the establishment of property rights, even if the fiction is created of holding the resource in trust for the original owner. Where there is no surviving occupier or manager capable of managing the resource, reallocations may include the creation of common property to be used under the control and on behalf of the community as a whole. Alternatively, it may become an open-access resource available to all comers to exploit as they wish, thus succumbing to the so-called "tragedy of the commons" (Hardin 1968).

8.1 COORDINATION OF RESOURCES

The resource abundance scenario seems most likely to apply to rural areas since urban areas with high population density are less likely to remain in the resource intensive state for very long without access to a food producing hinterland. For this reason, most of our description will concentrate on rural examples. However, we do not preclude the survival of urban-rural areas under these conditions, for example, where the pre-war direction of commuting is reversed as city dwellers sell their labor on farms. Other possibilities include small urban

manufacturing enterprises that are able to adapt to production of goods from local materials to satisfy post-war demands.

If pre-disaster property rights are respected where the distribution of resources is very skewed, the owners of land and agricultural resources and the owners of raw materials for emerging craft skills may take on the role of organizing productive labor. Survivors who do not control agricultural land and seed stocks will not be able to produce the diversity and quantity of foodstuffs necessary to support their families. Single families may not have access to sufficiently large plots of land to be fully self-supporting. Many will not be able to continue in their former occupations, having merely their labor power to trade. Landowners may be unable to use mechanized agricultural equipment, partly because of the lack of petroleum and partly because they are likely to diversify their crops due to the loss of centralized national markets.

Where resources are evenly distributed throughout the surviving community, for example in an area consisting almost exclusively of small family farms, the removal of formal government infrastructure is likely to leave coordination problems for a community of equals in the areas of communications, transportation, marketing, and the provision of public goods. Coordination problems may also arise in the event that prior property claims are rejected and major difficulties may emerge in the organization of labor and production. This may be the case either in the event that new property rights are based on common ownership or on an individual free-for-all. Decision makers will likely be faced with the problem of restructuring the coordination of resources to satisfy wants. Much of the coordination performed by the pre-disaster institutions and interregional market structures will be lost.

Whatever the distribution of resources, two major forces are likely to influence the recovery of resource coordination for exchange and production in the resource abundance scenario. First, with the removal of monitoring, dispute resolution, and enforcement infrastructure, there will be loosening of the constraints governing market opportunism (Williamson 1985). In effect, traders may be more likely to violate implicit or explicit exchange agreements where sanctions and enforcement are weak. This would increase the uncertainty of trade, making exchanges with temporal, spatial, or principal-agent obligations much more costly to trading agents.

Second, the removal of pre-disaster infrastructure and interregional market structures, in combination with the wholly changed demand/supply environment, would drastically alter the set of opportunities for trade. In other words, while many opportunities will be lost, others will be created. As Kirzner (1973) points out, it is the existence of unexploited opportunities for earning profits that stimulates middle-man behavior. This view is consistent with Schumpeter (1964), where firms are motivated by potential profits to create new ways of doing things and new things to do. Even under the resource intensive survival scenario, many old ways of doing things will be severely restricted or lost. However, the availability of resources will be an incentive for some people to innovate under the new

conditions. Evidence from self-help businesses suggest that innovations are more likely to develop where preset guidelines are at a minimum (Knight and Hayes 1982).

Unfortunately, the gains to middle men are likely to be limited by the increase in opportunism. Thus, profit opportunities will have to be large, relative to investment, to compensate these agents for accepting the risk of coordinating resources. In fact, the presence of extreme opportunism and the need to coordinate resources probably will discourage most loosely organized middle men and lead to the emergence of organized corporate groups led by entrepreneurial managers. Knight (1921) in discussing the relationship between profit levels, resource coordination, and managerial control, argues that control of, and responsibility for, resource coordination is strongly identified with entrepreneurship and profit seeking.

Of special concern is how the opportunities for entrepreneurship will be taken, given the increase in uncertainty from opportunism. Williamson (1985) argues that a competitive market structure may sufficiently govern exchanges, where the goods are non-specialized for the traders (middle-man behavior). If impersonal exchanges are not possible then extra-market governing institutions, such as firms, contracts and courts, will be necessary for stable exchanges.

It is important to recognize that the entrepreneurial role is not exclusively economic and is likely to fall on charismatic persons of high prestige such as clerics, respected community leaders and those emergent leaders who show particular skills for organizing during the crisis period. Thus, this part of the resource intensive system is strongly dependent on prestige exchange among organizers. Such organizers are likely to be recognized because of their roles in the associational exchange structures where they have developed proven ability as wheeler-dealers. These community organizers will thus correspond to the big men who mobilize individuals for major cooperative efforts to provide public goods as in traditional Papua New Guinea (Pospisil 1971).

Survivors in this scenario may cooperate to form production enterprises, especially in the urban organization of crafts and small manufacturing. However, as Durkheim (1893) points out, labor specialization makes members of a social unit highly interdependent, hence more vulnerable to risk. The loss of external markets and their governing institutions is likely to result in a reduced range of goods and services, even though resources may be abundant. Hence, we assume that the resource abundance scenario will revolve around a primary production/consumption unit based on the nuclear family. These units constitute a basic subsistence exchange structure. Where the primary family groups combine, forming new social networks and extended families to share and pool resources, then elements of intimate exchange structures occur. The reasons for the shift of large-scale anonymous individual exchange, characteristic of the best case scenario, into a more familial and intimate exchange structure are essentially the increase in trading risks and the loss of trust among trading partners. Only those who are intimates or part of an established trading network

are likely to be seen as trusted trading partners in the absence of an effective infrastructure that can guarantee exchange contracts. This may make it very difficult for middlemen to rekindle true market activity.

However, there will be entrepreneurial opportunities. Particularly since, as we have said, resource abundance need not be an exclusively agricultural scenario. Hydroelectric or mine-mouth fossil plants, which are located in rural areas, are likely to survive any largely urban attack. With no responsibility to government or stockholders, local managers/operators may see themselves or their communities as owners of the plant and become either powerful monopolists or managers of these resources as common property. Similarly, any property, such as plant, machinery, and products located in the rural or semi-rural areas, previously owned by national and multi-national corporations, also may be claimed by local managers and, together with utility managers and other entrepreneurs, form the hub of an eventual rebirth of industrial production. Once the utilities are operative, they paradoxically, could provide an abundance of power since the previous consumers in urban areas may no longer be there to demand energy. Nearby factories and communities may eventually form the nucleus of new cities, and attract populations from outlying areas.

The absence of currency may be an initial obstacle to these developments since systems of direct barter tend to be inefficient. However, this need not be the case under certain circumstances (Dalton 1982, Leijonhuhvud 1973). For example, barter may support trade where the medium of trade is scarce or money prices fail to adjust quickly to an economic environment that has radically changed. However, where direct swaps do generate intolerable externalities, precious metals and jewels may prove to be close substitutes for currency, provided appropriate assay skills are available within the community. Another possibility in cooperative communities is the development of time contracts in which goods and services are exchanged for promissory notes of labor time. This has the convenience of being infinitely divisible from months to minutes, and the contracts for time may be legitimated by the dispute-settlement system should they not be honored.

For example, in the Comox Valley of Vancouver (Hart 1986), a barter system called the Local Exchange Trading System (LETS) allows members to operate without money. Members of LETS submit information about the goods and services they have to offer for a notional green dollar amount. A member who wants another's service, but has no money, contacts the other member who provides the service and through the LETS office credits the supplier's account and decreases the demander's account. The supplier may require the services of others in the network who, because of this exchange, are able to employ the services of the original demander.

The unit of exchange, the green dollar, remains where it is generated, providing a continually available source of liquidity. The ultimate resource of the community, the members' productive time, is never limited by lack of money (Meeks-Lowry 1987).

Over the two years the scheme has been running there have been no problems with members defaulting on repayment. This is explained by the intimacy of the network and the trust that has developed between traders and for the system. Also, inability to pay is not a problem since green dollars never leave the community and are always able to be re-earned; the currency cannot collapse because it is based on the time and skills of the members. Other possibilities for generalized exchange outside of such an intimate network are discussed by Hart (1986), including buckskins (the origin of the term buck).

8.2 SURPLUS RESOURCES

The overall exchange system under the resource intensive scenario primarily is a combination of prestige exchange, peasant marketplaces, intimate, and subsistence exchange structures. These circumstances of survival create conditions for the development of a perpetual surplus for small to medium sized communities. Paradoxically, this development may begin when, because of the destroyed capacity to produce industrial goods, competition increases among individuals and between families for the remaining stocks of processed foods, appliances, and other manufactured goods, such as batteries. Such competition would result in an initial rapid rise in demand for these goods which peaks when these items are either consumed, break down, or are unrepairable. Beyond this, the practical significance of manufactured goods would continue to decline steadily as they are rendered relatively useless and are increasingly substituted by a growth in the supply of domestically produced goods and services.

In essence, society shifts from specialized goods and services to activities that are non-specialized and which afford greater levels of self-sufficiency. From the time of the disaster, survivors will have had an opportunity to become self-reliant through developing a domestic mode of production and adapting their rural skills to produce a variety of replacements for manufactured goods, in anticipation of their ultimate disappearance. In addition, however there may have been a change in the external demand of some goods, notably, food. The sudden destruction of urban areas comprising industrial infrastructure and its population may open the way for a highly productive rural population to overproduce survival goods, such as food, way beyond its needs. This may be exacerbated by stored supplies which survive the disaster. In short, among those who remain, there is the possibility of a surplus in available essential resources.

The combined effect of these conditions may alter survivors' perceptions of satisfaction from manufactured goods, producing a constraint on wants that Marshall (1961) calls "material plenty," with a low standard of living, or what Sahlins (1972) calls the "zen road to affluence." Like Sahlins' hunter-gatherers, the Amish Mennonite communities of Pennsylvania restrict the wants of their members, with respect to consumer goods in order both to maintain group solidarity and to guarantee availability of capital for essential resources (Hostetler 1963). Thus, both Bushmen and Amish are able to shape the utility functions of their members even, in the latter case, when they are

constantly exposed to the wide range of goods that entice members of neighboring communities.

It is, therefore, reasonable to suggest that under conditions of resource abundance, people may change their pattern of pre-attack wants and see their new wants as completely and infinitely satiable. Under these circumstances, there may be very little incentive to engage in economic activity for direct financial gains. Indeed, as the literature on hunter-gatherers suggests, production is likely to be low relative to its possible capacity; labor power underemployed, and technological means underused as are natural resources. Under these circumstances, surpluses would become available to trade, but, since all units have satisfied their own subsistence wants with a similar range of goods, trade is unlikely to occur. The possibility emerges that such a society will not create the critical level of diversity in endowments or preferences that Alchian and Allen (1969) identify as necessary to support the desire for exchange for financial gain.

However, exchange may arise from other motives. Under conditions of resource abundance, elements of prestige exchange structures are likely to be present. There is some suggestion in the anthropological literature that prestige exchange reduces the risk of trading where no formal regulation exists (Malinowski 1922). In other words, moral regulation is substituted for formal regulation. We expect a large reduction in trading for financial gain due to the absence of money and the high search and transaction costs. Thus, in the resource intensive scenario, exchange is likely to occur using goods as a medium to create social bonding, just as it does in poor urban areas at present (Stack 1974; Dow 1977).

Bell (1981:79) points out that relations of interpersonal trust regulated by customary ethics formed the basis of civil society from which the modern market system emerged.

The world of Adam Smith was one of thousands of small family firms, of visible merchants and customers, so that Smith could look to civil society, not government, as the arena in which competition would be regulated by custom and ethics, rather than by contract and law.

If prestige exchange forms the basis of civil society which is itself the foundation upon which the market system is built, it is important to understand how prestige exchange might develop under resource abundance. Initially, persons with access to the diminishing supply of manufactured products may accrue considerable prestige from the acquisition of these increasingly scarce resources. However, the source of prestige may expand to include domestically produced items at the point when all subsistence needs are met by the production/consumption unit. The possibility of prestige exchange to enhance social bonds is opened by the ability to produce large surplus quantities for competition regarding the amount of the good produced. The overall importance of the prestige exchange structure as an index of status, relative to trade for financial gain, itself increases because differences in absolute wealth will vary very little in the surplus

environment. This is one of seven changes discussed below, which characterize the economics of a surplus trading environment.

- o A major impact of the events producing the resource intensive scenario is the destruction of money as a medium of exchange. In these circumstances prices are likely to be determined through barter with the items and quantities exchanged displacing monetary prices as an indicator of value.
- o The large predisaster demand for a narrow range of agricultural products from the survival areas is likely to be severely reduced. The major consumers of these products, who previously lived in urban areas, may no longer be there and the means to transport the products may have been virtually eliminated.
- o Given the emergent perceived surplus of vital resources and the virtual elimination of those unnecessary for survival, time constraints cease to be binding. Nothing is particularly urgent, since everything needed is available and that which is not available is not of use.
- o Although there may be few limitations on time so that, theoretically, the market system will eventually respond in the short to medium term, time makes very little difference to the excesses of available products.
- o The changes in the demand and supply of goods combined with the shift in preferences brought about by the disaster may have a major impact upon the value of assets and the distribution of wealth. Some goods, once valued and representative of wealth, may no longer be valuable and their owners may be, almost instantly, relatively poor. Others, whose goods and services were of little use before the disaster, may suddenly become of great importance.
- o In addition, where there is destruction of records and property ownership, this is likely to render some debtors free of their debts and some creditors without claims to wealth.
- o Under the best case and institution intensive scenarios the possibility is present for government intervention in the distribution of resources. Under conditions of resource abundance, however, the centralized government, by definition, has been destroyed.

These seven factors suggest that exchange for financial gain is considerably reduced. However, the changes discussed above would produce a change in the kind of exchange rather than its reduction or elimination. Exchange for financial gain may be reduced considerably as self-sufficiency and the perceived surplus of food take hold. This situation also is likely to be encouraged by defensive cultural strategies. As Siegel (1979) shows, threatened groups seek to defend their cultural identity and this may be at the expense of other

interactions. Pueblo Indians, Black Muslims, the Amish, Hutterites, and Mormons have enforced detailed and rigorous codes for the regulation of their members behavior. They have increased cultural integration, and intensified communications within the group while minimizing communication with outsiders. However, some of the changes identified above are likely to create a demand for the development of social-control institutions to reduce the considerable conflict that emerges based upon the perceived perceived injustices of the new order. The existing infrastructure will be unable to respond adequately without resources being shifted into the creation of new institutions to support the new form of exchange and, in particular, the resolution of disputes.

8.3 FUNCTIONS

The resource abundance scenario will require that some of the fourteen functions of exchange institutions will be performed by institutional arrangements different from those operating under the best case.

1. Property rights, initially are likely to be defined by possession. However, the loss of central government and the urban economic and commercial centers will leave some property, previously corporately, state, or federally owned, open for redefinition. This may be privately appropriated, or be claimed by the local governing collectivity. Depending upon the extensiveness of the destruction, the loss of records for public utilities, in particular, may make such resources available for redefinition.
2. Within survival communities supply/demand information is likely to be conveyed by whatever networks remain from the predisaster rural infrastructure and will be supplemented by friendship and kinship networks and individual traders. A major problem may arise, however, for transfer of information between communities. This will need to be overcome if those developing craft goods and agricultural products are to trade with those that begin to resume industrial production. Initially, this role may be filled by ham radio operators and CB radios, as occurred in the Mexican earthquake and Chernobyl disasters. However, these forms of communication will be limited by the availability of power, batteries, etc. Traveling merchants, acting as middle men, may also serve to carry information between communities although, unless these persons are already known and accepted in more than one place, this form of information exchange may be severely limited.
3. An opportunity for legitimate transactions is provided by the remaining wholesale and retail outlets in particular by stores, farmers' markets, and flea markets. In addition, the farm and sites visited by numbers of people, such as churches and meeting halls, lend themselves to this function and are likely to be supplemented by kin- and friendship-based trading networks.

4. The provision of legitimate contracts within a community is likely to be dependent upon the type of property-rights system that emerges. Decision makers holding positions of power within the community probably will supplement existing law with rules to protect their private interests. Contracts between traders probably will be constrained by the customary rules of kin and friendship networks. In addition, where traders and farm cooperatives exist before the disaster, a collective constraint may limit the possibility of exchanges which benefit individuals at the expense of the cooperative.
5. The enforcement of contracts, other than by physical coercion, is likely to be carried out by the same institutions as those that limit the provision of legitimate contracts.
6. Dispute settlement may operate on a combination of various rules. The rural dispute settlement mechanism of settlement-directed talking probably will remain and is likely to be of the mediation and go-between type. Here justice is administered by negotiation. Bargaining takes place not only over the substance of the dispute but also over the rules and procedures that apply. Some attempt may be made to treat like situations in a consistent manner, but this will be flexible and open to negotiation, depending upon the circumstances and justice will be determined by results. Courts may still meet but, in practice, justice is likely to be administered according to community consensus involving relatively arbitrary application of formal rules and procedures. Appeals may well be arbitrary and relatively informal compared with the best case or institution intensive scenarios. In addition to these forms, greater use may be made of the private justice institutions in the remaining organizations. The result is likely to be a co-existing diversity of procedures for settlement which are institution specific and may range from authoritarian, through representative, to collective forms (Henry 1983). The sanctions applied in any one of this range of dispute-settlement systems also may be specific to the institution, but will tend more towards shaming, ostracism, and expulsion than to imprisonment, treatment, or fines, since the services available to administer correctional facilities would be diverted or depleted and, given the weakness of the formal enforcement infrastructure (lacking the authority of the state) collecting fines could be difficult. Sanctions against outsiders who transgress community rules may be punitive and harsh. However, internal sanctioning may be progressive, corrective, and restitutive, aimed partly at individual rehabilitation and partly to repair the breach in society. Finally, some settlement by contest may be present. This may take the form of the competitive destruction of property in abundance or the giving away of property which is valued.
7. Maintenance of civil order is likely to be carried out by the institutions, such as courts and police, that remain from

before the disaster. However, as various enterprises and organizations assume responsibility for policing their own members, private policing may be a more common feature (South 1988). Some conflict is to be expected between the private police of different land, utility, or factory owners, especially in the absence of a federal system of control. Community policing may be organized and take the form of volunteers, neighborhood watches, and generally avocational forms (Shearing and Stenning 1987).

8. The legitimization of other functions, including enforcement, will depend upon community norms and the predominant style of leadership that emerges. Where the community structure is dominated by the concentration of resources in the hands of a few property owners, legitimization will tend to be their prerogative based on the power of private property ownership and, as Renner (1949) points out, in its implied right to control people. In contrast, where resources are more evenly distributed, legitimization ultimately flows from the charisma of entrepreneurial leaders and the democracy of participation and negotiation.
9. Guarantees of currency and close substitutes, using a barter system without money as a medium of exchange, cease to be necessary, except insofar as those who trade need to guarantee for themselves the quality of their purchases.
10. Administration of distributive justice will probably continue to be carried out by the vestiges of the local infrastructure and some version of local taxes and sales taxes. But in this case, it probably will be based on payments in-kind. Where charismatic or entrepreneurial leaders emerge, the redistribution of resources is one of their sources of status. Under such a system too, prestige rather than goods may be the valued resource to be redistributed. Some churches and community associations may also perform this function.
11. Monitoring and modifying operations is part of the entrepreneurial role, but networks of kinsmen also will engage in continuous flexible assessment of an entrepreneur's work. As resource ownership is more concentrated, the system is likely to be less flexible as the responsibility for monitoring probably will be concentrated in a few hands. Since the information systems are likely to be less well developed, there will be less opportunity to make rapid changes than under the best case scenario.
12. Mitigation of risk depends on the extent to which social bonding can replace the destroyed infrastructural support systems provided by interest rates, insurance, etc. Risk is reduced, in part, by adopting a barter system, also by trading within a community and among members of a social network. In this case, risk is mitigated by eliminating exchange between traders who are unknown to each other. Such trade will only

continue with the emergence of trading middle men, who make contact with demanders and suppliers and earn a return for accepting the risk of coordinating the desires of these two groups. Within a community of equals risk is reduced by relying on the credit allowed and particularly by the institution of reciprocity. Preference for a series of smaller transactions rather than a few large ones reduces the risk of loss. Where resource ownership is more concentrated, risk reduction depends primarily on the preparedness of the private owners of land and utilities to underwrite the remaining elements of the rural infrastructure and to support coalitions of traders who wish to do the same.

13. Exploitation of comparative advantage, specialization, and the division of labor are likely to be reduced in the initial stages as people develop craft skills to replace vanishing commodities. Individual specializations may emerge in certain craft areas. However, where surviving energy resources facilitate the reemergence of industrial activity, it is to be anticipated that leaders of emerging industry will set up special trading relationships with agricultural areas.
14. Reduction of intertemporal or interregional transaction costs is not, initially, an immediate concern in the resource abundance scenario. Such transactions are unlikely to occur until specialized craft production or industry develops. When alternative communications and transportation are developed to replace those that were available prior to the disaster, special trading relationships may occur, tariffs may be imposed, and more formalized policing may be introduced to reduce the risk of theft.

8.4 CONCLUSION

In the resource abundance scenario we argue that the property rights issue is of central importance, especially since there is no centralized authority external to the community that can regulate and enforce ownership. Irrespective of the concentration of resource ownership, additional demands will be placed on the surviving community's capacity for the resolution of disputes, if only to settle issues of the fair reallocation of surviving property, especially where this is of unknown or uncertain ownership.

The resource intensive scenario describes a clear shift from a money-based to a barter-based system, out of necessity rather than choice. We argue too, that there are likely to be major shifts in supply and demand as goods cease to satisfy the wants of demanders and goods previously readily available become scarce or unusable. More importantly, we argue that, because of the unavailability of many goods currently taken for granted, their attractiveness may decline, a trend spurred on because there is a strong incentive to promote social cohesion rather than to pursue a rapid return to industrial production.

The tendency to seek social cohesion is likely to be enhanced by reduced specialization and a return to traditional fixed rules of allocation.

The resource intensive scenario indicates that one of the principal reasons for developing social cohesion is to restore institutions of trust to replace those destroyed by the ravages of war. Our discussion indicates that replacement institutions may vary significantly from established institutions. Where resource ownership is concentrated, replacement institutions may tend toward the authoritarian, where resources are more evenly distributed, prestige and informal social-control mechanisms are likely to substitute for formal regulation.

Finally, the resource intensive scenario provides significant possibilities for a return to some industrial market system and for the reconstruction of cities based upon surviving energy resources and existing local institutions.

9. THE INSTITUTION INTENSIVE SCENARIO

The institution intensive scenario is based upon the assumptions that endowments and resources suffer heavy damage and institutional infrastructure remains largely intact. For example, a plausible setting would be an urban location, perhaps a state capital, which depends on outside suppliers for food and many manufactured goods as well as raw materials for local production. The institutional infrastructure which interacted with market structures in the best case scenario is present in this scenario, however, many of the resources which were exchanged in the best case markets are lost or severely restricted. This loss of resources is assumed to extend to many of the physical resources that support intercity/interregional communications and transportation so that migration from the institution intensive setting is either very difficult or involves a high level of uncertainty. Thus, the city is faced with the oversight of its surviving population, given a viable institutional infrastructure that includes a banking system, a system for the recognition, protection and enforcement of property rights, a political system, and a legal system for the settlement of disputes.

This analysis of likely institution intensive market structures differs from prior work in two important respects. (In particular, see the 1987 survey by Hill.) First, although the adaptation and efficacy of institutions to the new resource constraints is a relevant consideration for our analysis, the underlying assumption that institutions have sustained only light damage should not be forgotten. Second, our analysis makes no attempt to argue about optimal responses of the extra-market institutions. The intent here is to delineate possible responses based on empirical and theoretical evidence and some understanding of the exchange problems that the institution intensive world will face. As was stated in chapter one of this report, the determination of appropriate policy actions is more closely linked with the criteria of applicability and stability than with the criterion of optimal resource use, although these criteria are not entirely unrelated.

A review of some of the literature on World War I and II US economic policy, European reconstruction, and post-disaster economic recovery provides a basis for identifying policy problems for the surviving institutions with special reference to market activities. We did not review the extensive literature on centrally planned economies because of our focus on the trends and tendencies of exchange systems originating from largely market-based economies. Most of the centrally planned economy literature focuses on the inefficiencies and problems of centralized systems and not the transitions from different types of exchange organizations. Therefore, we considered it less relevant to the scope of this study.

9.1 MANAGEMENT OF SCARCE RESOURCES

Much of the literature that was reviewed derives from a policy perspective, thus, there is generally an assumption made, implicitly or explicitly, that government institutions survive largely intact to manage severely damaged resources. When this assumption holds, significant destruction of resources will affect many aspects of formal market activities including the loss of technical capabilities, wealth, and information. Six problems have been suggested by the economic recovery literature:

- o Given the survival of a credible currency system, in the absence of currency reform there will be excess purchasing power. Excess purchasing power can lead to rapidly escalating prices in uncontrolled markets. This problem results from the large cash and liquid-asset balances that consumers may have relative to the number of goods and services that they can purchase following the destruction of resources.
- o There may be additional demands on the remaining resources resulting from the disaster. For example, the additional demands may occur as resources are required for additional medical services, the adaptation of traditional technologies that depend on lost raw materials, the development of new skills, and the need to restore communication and information systems where the physical resources for these activities have been damaged. Another consideration is the escalation of factors underlying market failure, e.g., uncertainty and externalities, so that even undamaged resource markets may fail to operate without government intervention. As an example, the credit market is likely to have difficulty functioning given the prevalence of uncertainty about the future.
- o Given the loss of vital resources, there will be a number of binding time constraints within which actions must be taken, or population survival cannot be assured.
- o There may be an abrupt shifting of demand and supply curves as supplies are damaged and preferences are altered by the disaster. These changes may not only affect prices and quantities but market power balances as well.
- o The shifting of demand and supply curves will likely affect the valuation of assets and subsequently, the distribution of wealth. Such changes hold the possibility for large winners and losers in financial wealth.
- o Financial wealth will also be affected by the disruption of pre-disaster market and distribution arrangements. For example, disruptions may result from the inability of market agents to fulfill contract obligations for financial transactions, production, and consumption.

9.2 LOSS OF MARKET FLEXIBILITY

As Olson (1963) points out, one of the most difficult problems to be faced is the loss of flexibility in the economic system. This flexibility arises from the many possibilities for substitution in the production and consumption processes for goods and services. Thus, as prices rise for particular inputs, producers or consumers can usually respond by making substitutions with relatively cheaper resources or goods. A major disruption in resource supplies will limit many of the substitutions that are technically possible. Loss of information and communication resources will also impede the ability of producers to respond with technological change.

Given no limitations on time, flexibility can be restored to the economic system. Olson's preference for the use of the market system to direct resources is largely based on the assumption of non-binding time constraints. However, the time dimension has been emphasized by Winter (1963), who points out that an environment reflecting the institution intensive assumptions will involve a race between the restoration of productive capacity and the depletion of inventories for vital goods and services.

Considering the problems to be addressed and the limitations on the amount of time available to respond to them, decision makers in the extra-market institutions will have to decide if formal markets can provide viable solutions for resource allocations. While an overwhelming number of recommendations from the research on post-disaster economic recovery support reliance on the market system (Hill 1987), there are some important aspects of the institution intensive scenario which make solutions other than the market solution more likely for goods and services that are considered necessities.

First, market allocations, because they are driven by the decentralized decision making of large numbers of traders, necessarily take time to respond to changing market conditions. Thus, prices may reach prohibitively high levels for a large proportion of the population and remain there until demanders and suppliers find alternatives. How long the high levels will persist depends on the level of market power in the markets as well as the rate of production and technical change. In addition, if barter is discouraged, the price adjustments may be delayed further by restricting the local demand and supply information produced by barter (Leijonhuhvud 1973). The adjustment process of conventional price mechanisms may not be acceptable or even feasible in the post-attack environment for the food, shelter, and medical-services markets.

Second, the prevalence of uncertainty is an another obstacle for the ability of the formal markets to formulate new plans and respond to price signals. Third, the high survival of institutions within a limited location will imply that they have relatively more administrative capacity than market agents, since local markets tend to be interdependent with extra-local markets. Finally, regulation and government control are not immune to the forces of supply and demand.

With respect to the first three aspects, analyses of World War II policies can be insightful. Given the American and British policies during and after the war, a number of studies have noted how effective these governments were in managing the use of resources that were abruptly in short supply (Olson 1963, deChazeau et al. 1946, Homan and Malchup 1945). Olson argues that the success of British food programs during the war was due largely to the government's ability to encourage substitutions in production and consumption both to increase nutritional output and conserve scarce shipping and storage resources. Government controls were placed on consumption, shipping, and agricultural production and significantly altered economic activity. Food consumption was controlled by rationing, regulations, subsidies, and price controls. A combination of production goals, regulation, and price incentives was used to decrease the production of livestock and increase the production of cereals and grains. In the US case, government control was used to direct resources to the production of war materials and later to redirect these resources to peacetime production. Of special concern for the US cases was the potential for inflation and depression in the post-war transition since there was a surplus of labor.

The British and American cases never approached a level of control implied by the concept of "disaster socialism" discussed by Winter (1968) and others. (Disaster socialism would imply a command system for all major allocations, i.e., complete specification of who gets what and how much they get.) Rather, control was exercised through a system of selective intervention to manage resources where the unaided market process was assumed to be inadequate to meet the country's needs. Furthermore, much of the success of these programs is attributed to the willingness of the population to comply with the restrictions, suggesting they enjoyed a substantial level of public support (Olson 1963). This point is important with respect to the abrupt shifting of supply and demand conditions expected in the institution intensive scenario and seems to be ignored in many of the studies of post-disaster economic recovery. Given that government decisions are not immune to the demands of the governed, to what extent would government control of particular markets or selective intervention be a preferred solution?

9.3 DEMAND AND SUPPLY OF PUBLIC REGULATION

The literature on regulation suggests that political decisions, especially those regarding regulation, are strongly influenced by the attempts of one or more groups to extract an income transfer from other groups (Stigler 1971). These payments are transfers because they exceed the minimum payment necessary to cover the incremental real costs of resources in the provision of the goods or services and involve a transfer of one group's surplus in exchange with that of another group. More generally, the demand for regulation will depend on the costs of organizing the groups which benefit from the regulations and the potential gains from securing the regulations (Peltzman 1976).

The costs of regulation include not only the resource costs of compliance but also the loss of support from the harmed groups, to the

extent that they are organized and aware of the costs being imposed on them. Thus, disparities in the costs of organizing groups that are decentralized can influence the decisions regarding market intervention (Arrow 1969, Benson and Faminow 1986).

In addition to the possibility of increased demand for regulation, there are several reasons that suggest there will be an escalation of government control and intervention into some markets that were largely unregulated in the pre-attack environment. First, in the institution intensive scenario, the government institutions have survived and it is within their traditional roles to respond to requests for disaster compensation. Second, the costs of organizing have been reduced by presenting a much narrower scope of concerns to potential demanders. Further, the suspension of normal activities make it easier for groups to devote their time and effort to organizing, even if these resources are at first preoccupied with emergency activities. Third, given differential damage, there is likely to be some demand to resolve large inequities in the remaining resource distribution. Fourth, the pre-attack motivations to demand regulation for the gain of market power or the protection of income can be expected to survive as well. In fact, these motivations may be even more prevalent in the institution intensive scenario than in the best case, since there is likely to be a reduction in competition among remaining market agents and the gains from favorable regulation vary inversely with the level of competition (Tollison, 1982). Finally, it has been argued that because personnel in public institutions face incentives that are largely status orientated and not financial, public managers attempt to increase budgets or institutional power rather than to constrain costs (Niskanen 1979).

Even if the government rejects the use of intervention and prefers using the price mechanism to allocate goods and services, this may be undermined by behavior in the private sector. In a study of the West Coast Gas Famine of 1920, Olmstead and Rhode (1985) argue that private firms in the petroleum industry voluntarily rationed gasoline without government intervention. Traditional explanations, such as the threat of intervention or attempting to discourage market entry, do not explain the rationing programs followed by leading oil companies at the time. The authors find a more convincing explanation in the conflict of short-term versus long-term goals:

According to SOCAL's past chairman, R. G. Follis, oilmen also viewed the purely economic consequences of a large, market-clearing price increase as detrimental to their long-run interest. SOCAL's leaders saw the company's prosperity as integrally tied to the economic development of the West, and they accepted considerable responsibility for promoting that development. Given this attitude, Follis thought it would have been unwise to shock the economy with enormous fluctuations in oil prices. To encourage western economic development and the rapid conversion to petroleum fuels, industry leaders thought it essential to assure agriculture and business a guaranteed supply of energy (p. 1054).

In addition, Olmstead and Rhode suggest that the perceived causes of the shortage influenced the decision to ration. Instigated by a drought and an illegal railroad strike, the industry sought to preserve the appearance of being fair and patriotic by not exploiting the situation for short-term gain.

Fairness in the wake of events beyond the control of market agents has been seen as affecting market behavior in other studies. Plott (1986) discusses some experimental economic studies which suggest that an allocation of property rights based on chance will lead agents to share the gains from trade in a more egalitarian way than when the rights are allocated on the basis of skill. Garner (1986) argues that people's feelings of inequity significantly influence their productivity. Thus, "how society slices the economic 'pie' generally affects the size of the pie" (p. 262). Such explanations have been used also in the analysis of public acceptance of risky technologies (Rayner and Cantor 1987). Finally, Arrow (1969) and Hirshleifer (1985) argue that establishing a sense of the greater good through common property rules or public intervention can entice individuals to act in the public interest.

On the basis of these arguments, it is likely that the surviving institutional infrastructure will be called upon to use selective intervention as a response to major destruction of resources. It also seems likely that such intervention will not affect all markets, in particular those for non-essential goods and services may remain relatively unregulated. Of course, it is difficult to specify the goods and services that will be labeled essential in such a world, since this determination will depend on the resource damage. However, food, water, shelter, medical services, transportation, and labor markets are likely candidates.

Although we regard extra-market intervention as outside the rules governing market structures, regulated market structures are introduced in this chapter to demonstrate their implications for market rules. Unfortunately, it is also likely that the extra-market institutions will not respond with appropriate controls in every targeted market or ignore compounding problems such as excessive purchasing power and incentive incompatibilities. Criticisms of the failure of government to balance market controls with appropriate fiscal and monetary policy dominate the post-disaster economic recovery literature. Implicit in these criticisms is the debate over piecemeal policies versus holistic public policies.

The lack of balance in public intervention is often at the heart of the negative outcomes following the intervention. For example, the use of price and wage controls in post-World War II Germany was not balanced with monetary reform to reduce excess purchasing power and fiscal reform to subsidize investment in desired production capacity (Hill 1987). Similarly, although regulatory reform to stimulate production was effective during the use of wage and price controls in the US during the 1970's, the program was undermined by the expansionary fiscal and monetary policies early in the period (Pohlman 1975). Finally, even if well-intended, the uncoordinated or unbalanced efforts of extra-market

institutions may create shortages or disincentives to supply that will be conducive to the formation of market structures outside the legitimate market system.

Finally, under the conditions of this scenario, it is possible that the government could elect to enter the market directly as a quasi-public trading agent, e.g., a corporation similar to the Tennessee Valley Authority. While the use of state-owned enterprises is quite common outside the US, for example, in Canada, France, and the UK, they are not used generally to correct market failures in the contemporary US. A major exception is the the use of local municipalities to produce and distribute electricity. An increased use of this type of instrument to facilitate market activities is likely to depend on two factors. First is the governing authority's ability to obtain the resources necessary to start such an enterprise. Second is the belief that the public sector has some comparative advantage relative to a similar private undertaking.

9.4 ESSENTIAL GOODS AND SERVICES

The exchange of non-essential goods and services will be affected by other markets for essential goods but is likely to be free of additional government control. Production may be affected if the process uses resources that are determined to be essential, and continued production of the non-essential good may even be prohibited. Given the additional demands on productive resources by essential goods, any continued production of non-essential goods will probably be small scale and localized. Trade may continue for a time under the pre-attack market arrangements, for example in a particular store, but as more and more resources are directed to essential activities, transaction-cost considerations will force a consolidation of this type of market activity to a peasant-market structure with general marketplaces, similar to pre-attack flea or antique markets. Surviving malls and shopping centers are likely spots for such marketplaces to develop. Exchange in such public places will inhibit extreme use of monopoly or monopsonist power, reduce marketing or advertising costs, and reduce search and informational costs. Given the extreme reduction in resources, there will be strong incentives to reduce the costs of exchange for non-essential goods.

The markets for essential goods and services are the most susceptible to government intervention to alter the market process. This follows from not only their importance to population survival, but also the conditions present to increase substantially the demand for regulation and control in these activities. We consider three areas of intervention that will alter the rules of pre-attack market structures: regulatory controls, fiscal policy, and monetary reform. The first area can affect any number of specific market rules, including the transaction rules. The second and third areas have a direct effect on demand and supply, but in general, only indirectly affect transaction rules through changes in the degree of competition or market power, i.e., shifts in market structures.

Stone (1982:10) defines regulation as "a state-imposed limitation on the discretion that may be exercised by individuals or organizations, which is supported by the threat of sanction." In the analysis of unregulated market structures, discretion is often limited by technical or network constraints but unconstrained by government intervention with the exception of illicit activities. Rules in the associational and criminal markets reflect indirectly the enforcement of regulations on legitimate activities.

For the institution intensive scenario, the objectives of select intervention through regulation are likely to be redirecting and expanding productive capacity, conserving targeted resources, and population maintenance. Achieving many of the objectives of the pre-attack regulatory system will become prohibitively expensive in the post-attack environment. Given that there are few resources for regulatory innovation, regulators probably will prefer tools that are either familiar or easily enforced. Three types of tools which have been used in prior emergencies are process standards, rationing or fixed-allocation systems, and wage and price controls.

Process standards include regulations which specify minimum or maximum limits on aspects of the production process. These aspects can include inputs and outputs, as well as quantities and qualities. By imposing process standards, regulators can restrict the set of possible production choices available to suppliers. Alternatively, regulators may expand production choices by removing process regulations imposed by the pre-attack regulatory system. As an example, regulators removed certain restrictions on livestock grazing on set-aside acreages to increase supplies of meat during the wage and price control period of the 1970's (Jones 1975). Restrictions affecting either maximum or minimum quality levels are likely to be imposed on the processes to prepare vital food, as shown by the British example during the First and Second World Wars.

Process standards can be used effectively where compliance costs are reasonable. In general, they will affect the supply rule regarding institutional constraints. If the regulations appear unpredictable, they may become one of the major uncertainties facing suppliers and thus affect transaction rules. In the absence of voluntary compliance with government regulations, monitoring costs and reporting by suppliers to assure compliance will place an additional demand on resources. This demand will vary directly with the number of suppliers to be monitored.

Berenbeim (1981) argues that one unintended effect of process regulation is its differential impact on small and big firms. In essence, there may be economies of scale with respect to meeting regulations, especially in the demonstration of compliance. Further, monitoring costs will be lower with a few large producers than in an industry made up of many small suppliers. In addition, less competitive, large firms may be more resilient to the impacts of increased regulatory costs because they tend to start from a position of excess profit margins relative to small, competitive firms. Thus, increased government intervention, undertaken to direct the flow of essential resources in short supply, may also be a contributing factor

in increasing the concentration of market power. If regulatory costs are high, then the government may be forced to limit the numbers of legitimate suppliers as in oligopoly or monopoly markets, in order to have a market at all.

Especially in the two World Wars, rationing was commonly applied in situations where important resources were severely restricted. In addition, it was an important policy tool in the reconstruction plans of many European countries (Milward 1984). There are several general ways a government may ration resources or goods. The government may establish allocation priorities and thus, alter the rules of who, when, or where the good may be demanded or used in production. These priorities may be linked to a quota system regulating the amount each legitimate demander or producer may receive, thus altering the rule of how bids to buy or offers to sell are made. Finally, since allocation schemes and quotas limit supplies, they may shift the unregulated market structure to a less-competitive structure.

Rationing may be performed in the distribution of goods and services using coupons or queueing. These methods are likely to completely alter pre-attack supply and transaction rules, affecting not only who supplies, but how, where, and when transactions take place, and the transferability of property rights. An extensive system of rationing by queueing may even alter the medium of exchange, where money may be replaced by waiting time (Barzel 1974). Efficiency in the allocations of the rationed goods may be preserved if secondary trade among individuals is allowed by the rationing rules (Sah 1987).

Finally, government may impose wage and price controls and then allow sellers to distribute their available supplies at the fixed levels. In the system of market-structure rules, these controls will affect how offers to sell are made and how goods and services are priced. Where the government fails to set priorities for the distribution, it is likely that the sellers will devise an allocation system of their own. For example, sellers may sell on the basis of: first-come, first served; established trading relationships; or only when monetary prices are supplemented with payments-in-kind.

Selective intervention through fiscal policy probably will be very similar to the institutional processes that survive in the institution intensive scenario. Generally, every level of government engages in fiscal policy of some kind to encourage certain economic activities and discourage others. Further, taxing and spending capabilities will be in place, although some adjustments to the system may be necessary. In an effort to influence supply and demand for essential goods and services, the government will be in a position to affect prices through taxation, subsidization, and government procurement. Fiscal controls may be used to shift supply and demand, as well as to alter production or consumption processes by the differential taxation of inputs or goods.

Finally, monetary policy may be used to remove purchasing power from demand. While this can be done generally by monetary reform, it can also be used to direct resources into specific markets, and away from others, by altering the worth of specific asset types. Such a

policy was followed in post-World War II Germany, where bonds and mortgages were revalued in the new currency at a higher exchange rate than the rate used for more liquid assets (Hill 1987).

9.5 UNCONTROLLED MARKETS

If government controls are not politically supported or are grossly inefficient, it is likely that trade for the essential commodities will be conducted in markets outside the legitimate or controlled structures. Depending on the level of resources devoted to monitoring and enforcement of the intervention controls and the level of resources necessary to evade the controls, informal markets in goods and services may arise that exhibit the rules characteristic of the associational market or the criminal variation of this market. Radford (1945) describes the markets within a prisoner of war camp where exchange rules mimicing market activity were allowed to flourish in spite of the highly regulated atmosphere.

Where government enforcement is lenient or monitoring of formal transactions and/or activities very costly, associational market structures may arise to reallocate goods to more highly valued uses than would occur under the controlled mechanism. Where enforcement is strict or monitoring of formal activities very easy, trade in legal associational market structures will be too risky, and the criminal variation is a more likely outcome. However, unlike the best case scenario, trade in institution intensive informal markets is likely to occur at prices that are higher than the formal markets prices, as economic agents attempt to obtain goods regulated by rationing or price controls.

This scenario concerns a world that is institution intensive relative to available, usable resources. We expect the associational markets, peasant marketplace, imperfect competition, oligopoly, and monopoly markets to be the primary structures of exchange in this scenario. Exchange approaching the perfectly-competitive market will be very unstable because of the high levels of uncertainty and the likelihood that it will be profitable for groups to form coalitions. Further, although imperfect competition may exist, it will be difficult to maintain without explicit government intervention to prevent mergers among suppliers.

9.6 FUNCTIONS

The institution intensive scenario resembles the best case in that it has an operating infrastructure. Below, we examine how the basic functions will be performed by the remaining institutions and exchange structures. The severe limitations on available resources to perform the necessary and facilitating functions for exchange in the institution intensive scenario produces significant differences from the ways they are performed in the best case scenario.

1. Define property rights. The local court and regulatory systems will continue to define and enforce property rights in the institution intensive setting for most of the formal-market transactions. However, individuals are likely to seek coalitions with other property owners since at the low resource level, property disputes may be expensive to settle in the court system and protection of these rights will also be costly. In illicit informal exchange, property rights are defined within the criminal market.

The government may use shared or common property rules to encourage an atmosphere of fair distribution as one way of establishing its authority position. This is particularly important where the surviving population is making demands on the government to regulate the distribution of essential goods and services.

2. Convey supply/demand information. In the best case, prices or social networks largely performed this function. Given that prices may be either controlled or supplemented with payments-in-kind in the institution intensive scenario, supply/demand information will have to be collected and distributed through other means. One source might be government sponsored programs similar to those used by the Cost of Living Council in the 1970's. Another source may be the increased network activity by market agents, especially where the rules of associational or peasant markets dominate exchange. Information reported through network ties or the visibility of displayed goods (or lack of them) for sale may act as a substitute for the formal price mechanism.
3. Provide opportunity for legitimate transactions. To some extent the government will perform this function directly when it uses a rationing or allocational mechanism to distribute goods and services. Where government regulation acts to create less competition among firms, the resulting market power may limit some of the transaction opportunities for demanders. In the informal exchange, the associational networks will serve to expand the trading opportunities among members.
4. Enforce contracts other than by physical coercion. The desire for repetitive exchange will act to enforce contracts between traders in divisible, non-essential goods. Where there are non-divisibilities in consumption, advertising and other informational services will be costly since communication resources are limited. Thus, the conditions are more consistent with the informal exchange rules governing the enforcement of property rights. In previously formal markets, traders are likely to look either to the formal legal system to enforce contracts or seek membership in a coalition to increase their market power.

6. Settle disputes. To the extent that the parties involved in a dispute are difficult and expensive to identify, the dispute will probably remain unsettled. The government may desire to demonstrate its willingness to settle disputes in order to avoid civil unrest. Traders that enjoy some degree of market power may settle disputes by re-negotiating prices after the transaction is complete. Such actions favor the rules of imperfectly competitive markets. Thus, we would expect an increase in the network ties or trade relationships among parties to avoid the risk of unsettled disputes.
7. Maintain civil order. This function will be carried out largely by the surviving government authority. In the peasant marketplaces, a market patron, e.g., a religious leader, may serve to maintain civil order in localized marketplaces.
8. Legitimate other functions. The government's authority to legitimate its control over other functions, including enforcement, pricing, and guarantee currency, will be a problem when this authority is not vested with the surviving level of government of the pre-attack period. For example, a city government will not have the authority of the state government, which, in turn, does not have all the powers of the federal level. Unless some program is in place, pre-attack, to transfer these powers to the surviving government level, and the program is sufficiently acceptable to post-attack survivors, then surviving government authority for specific functions may be challenged. Where the authority is vested with the surviving government, for example, in the case where federal infrastructure survives, the authority must be supported by the surviving population because of the lack of resources to coerce private behavior.
9. Guarantee currency and close substitutes. The guarantee of currency is one function that may be challenged in the absence of public support for the surviving government, especially if this government is below the federal level. As with the best case, the value of close substitutes will depend on the primary markets for their exchange. However, these values may be distorted by government interventions, especially if there is government confiscation of these resources.
10. Administration of distributive justice. Where goods and services are rationed, distributed through allocation schemes, or taxation is used to redistribute wealth, the government is engaging directly in distributive-justice activities. The private sector may also engage in these activities within associational networks, or by forgoing profit opportunities as in the case of the West Coast Gas Famine.
11. Monitoring and modifications of operations in response to changing circumstances. Programs that are directed by the governing authority to allocate scarce essential goods are likely to use command rules. The rules will not respond to

changing demand and supply information any better than traditional rules of fixed allocation, unless additional mechanisms are simultaneously put into place. Markets where competition is limited also will be slow to adjust to changing market conditions, since the threat of shifting market shares is not very great, i.e., conditions are more favorable to monopoly or oligopoly rather than imperfect competition. Exchange that is conducted through the associational markets is likely to be the most responsive to changing conditions where information about the changes can be observed and market power between buyers and sellers is more balanced.

12. Mitigate risk. It is not likely that the formal market structures will be able to perform this function without government intervention. This follows from the loss of resource diversity and increase in uncertainty. Thus, market traders will not have the options of using traditional mitigation mechanisms offered in the best case markets: diversification of resources holdings and insurance (Stiglitz 1974). Risk mitigation may be performed by the strengthening of network rules, thereby increases the importance of associational exchange or less competitive forms of the formal markets.
13. Exploit comparative advantage, specialization, and division of labor. Due to the escalation in the instances and causes of market failure, it is unlikely that these functions will be performed effectively while resources are severely restricted. Further, many pre-attack skills will be of little use in the institution intensive scenario. Finally, these functions will be damped by the effects of government control and direction in essential markets. Other than specific intervention by the governing authority, this function may be fulfilled by the rent-seeking behavior of market agents. In other words, as agents attempt to form coalitions or networks to increase market power, they may also exploit labor specialization and comparative advantage.
14. Reduce transaction costs for intertemporal or interregional transactions. Interregional transaction costs will be reduced by the restoration of communication and transportation resources. Government intervention probably will be required because of the public-good characteristics of these services. Intertemporal transaction costs are likely to be high given the pervasiveness of uncertainty. Except for network transactions, credit will be difficult to obtain from private lenders in the absence of government guarantees and subsidies.

9.7 CONCLUSION

The extra-market institutions will be required to play a more dominant and visible role in the institution intensive scenario than under best case conditions. In addition, we expect a much narrower

range of formal market structures to function in the post-attack environment because there will not be the resources to support market diversity. Furthermore, the factors which commonly underlie market failure will be exacerbated under institution intensive conditions. These factors include information and transactions costs, externalities in consumption and production, extreme market power, and uncertainty. Finally, because the institutional infrastructure will be largely intact, we expect surviving groups to increase their demands for government intervention in the wake of mass destruction of resources.

We expect many of the rules used in the best case to influence the rules of the infrastructure in the institution intensive environment. This is even more plausible if federal and state institutions survive intact. Most trading is expected to operate under a largely private-property system, except if the government actively attempts to enforce common property rules to promote social cohesion among survivors or the government enters the market directly as a quasi-public trader. Open access to property is very unlikely, since this would only exacerbate civil unrest and deterioration of confidence in the trading environment. Where unclaimed property exists, the government will probably institute a rule to establish a new owner, for example, homestead rules.

Currency can be guaranteed if the survivors see the government as a legitimate authority to perform this function. Continued credibility of the currency is more likely where it is sufficiently circulated and recognized by commercial agents. The encouragement of general credit may be more of a problem, since private traders may be reluctant to take even minor risks involving strangers.

The highly uncertain environment and drastic reduction in consumption and production possibilities may act to increase the market concentration among consumers as well as among producers. Consumers will attempt to transact in associational markets to reduce transaction costs. Suppliers will seek mergers to reduce the uncertainty of input availability and output demand. Further, government monitoring and enforcement activities may encourage market concentration as suppliers seek to minimize the costs of compliance.

Establishing a credible position of authority will be a significant and difficult task for the surviving government in the institution intensive scenario. This will be true for local and federal levels of government. In the presence of massive destruction of resources, the government will have to rely on the support of the surviving population to enforce its authority over many critical functions. Without this support, the environment could decay quickly into the conditions of the worst case scenario. Thus, responding to the political demands of the survivors to earn their support is likely to place significant constraints on the government's options in restoring economic activity.

10. CONCLUSIONS

The analysis in each of the scenario chapters indicates that not all exchange structures are expected to be stable in all environments. Table 1 summarizes the relationship between scenario conditions and stable exchange structures. Underlying the hypothesized stability of any exchange structure is a required consistency between the scenario conditions and the constitutive rules of the structure. Our analysis has indicated that market exchange structures are more likely to survive and remain stable in the scenarios with low damage to institutions. The nonmarket structures are more dominant in the scenarios where institutional damage is great.

Consideration of the combination of rules vectors that constitutes the overall exchange process in each scenario yields a range of tentative conclusions. Of particular significance are the definition of property rights; currency versus barter, including problems of credit; demand and supply, including changing wants; modes of production, including the division and scale of labor; and issues of trust and authority. Additionally, it is appropriate to consider the routes by which exchange structures could develop towards the eventual restoration of a pre-attack industrial economy.

Table 1. Exchange structures combine differently in each scenario

Exchange Structure	Scenario			
	Best Case	Worst Case	Resource Abundance	Institution Intensive
<u>Nonmarket</u>				
Subsistence		x	x	
Prestige		x	x	
Intimate	x	x	x	
<u>Market</u>				
Peasant		x	x	x
Associational	x	x		x
Criminal	x	x		x
Perfect Competition	x			
Monopoly	x	x		x
Imperfect Competition	x			x
Oligopoly	x		x	x

10.1 PROPERTY RIGHTS

Our examination of survival scenarios has shown that previous studies were right to emphasize the importance of establishing property rights for post-attack recovery. However, prescriptions to restore pre-attack private property rights need to be tempered by consideration of the level of survival for both resources and institutions.

Our examination of property rights at different levels of survival indicates that, at low levels of institutional survival, i.e., the worst case and resource abundance scenarios, specific property rights will not be definable by centralized policy, but will emerge from the necessity of what goods survive combined with the particular vision of distributive justice that predominates among the survivors.

Private property owned by anonymous shareholders, e.g., corporate property or unclaimed lands, is likely to be a prime candidate for redistribution. In contrast, a community's common knowledge of the ownership of lands and homes by identifiable individuals probably will be respected where possible. However, even if survivors desire to maintain pre-attack property rights, the collapse of currency and the whole structure of financial debt, would lead to serious and widespread disputes about the just reallocation of surviving real property to compensate for the loss of financial entitlements, e.g., savings accounts and personal debts. Destruction of land registries, mortgage records, vehicle and boat registries, and banking records would make settlement of such disputes all the more difficult as would the absence of consensual authority to adjudicate.

Even in the institution intensive scenario, the governing authority might not do best by supporting all pre-attack private property rights. Long-term recovery might be better served by the avoidance of civil unrest and the promotion of social bonding through partial compensatory reallocation on deep-pocket principles or participation in common property rights. Common property rules may create the incentives for individuals to act in the interests of the whole. Such actions might follow from the need to demonstrate government response to the demand for public intervention into market activities.

A common property system would make fixed allocations of goods and services to individual and group members. Efficiency may still be promoted under a common property system as long as transferability of these individual shares is preserved. But, by displaying fairness in the initial allocations at the beginning of the production/consumption process, rather than through redistributive activities at the end of it, the rule maker demonstrates a commitment to equity during the critical early period of recovery. Over time, as the fairness of the exchange environment and trust in trading partners is reestablished, the environment is more conducive to exploiting gains from trade and the establishment of greater individual control over resources.

The only scenario in which there is a prima facie case for the unaltered maintenance of pre-attack private property rights is the best case. In other scenarios, some redefinition of property rights is

highly likely, especially where there is little institutional infrastructure or few resources to enforce pre-attack private-property rules.

10.2 CURRENCY VERSUS BARTER

Prior analyses have argued that the restoration of currency is a priority for post-attack recovery in order to avoid the inefficiencies of barter. In this respect, they share the prejudice that barter is necessarily less efficient than currency because it imposes high transaction costs.

These costs arise from the need for traders to negotiate face-to-face and because information, in the way of a price signal, does not spread to the rest of the market. Furthermore, traders may not know what others desire, or there may be difficulties displaying and transporting goods for exchange. However, there are conditions where barter can be more efficient than cash transactions.

Where currency is in limited supply or has limited credibility, but labor services are available, transaction costs will be lower if a trader can swap labor for goods directly, as in the resource abundance scenario. In other instances, barter may overcome informational inefficiencies in a changing environment. Where prices are established by customary allocation (as in the worst case) or command levels, or simply take time to change (as in the institution intensive scenario) traders may not have information on how demand and supply information has changed. In these conditions, barter may encourage continuous transactions in an uncertain environment.

Centralized currency is entirely dependent on the credibility of the institution that underwrites it. No such institutional framework exists under the worst case or resource abundance conditions of survival. In these cases, currency, or close substitutes, may emerge from a quite unexpected source. Specie money, like gold coin, may well derive from prestige-exchange items that initially have fixed values in a restricted sphere, e.g., Kwakiutl coppers. These scarce goods cannot be exchanged for what are considered commonplace, or non-prestige, goods. However, those that are durable act as a store of value. Those that are most liquid become exchangeable, at traditionally fixed rates, for all other prestige goods, though not for commonplace goods. Those that fulfill both conditions become specialized currencies within the prestige system.

True money, a general medium of exchange, may emerge in at least two ways. First, through an innovation in the rules that permits the specialized prestige currency to be exchanged for commonplace goods (e.g., gold). Second, through the introduction of a novel commodity that is not traditionally defined as either a commonplace or a prestige good (e.g., Western paper money in tribal societies) and can, therefore, be used as a medium through which both types of goods may be traded for each other. Such innovations may be the result of convenience or necessity.

We have seen that the prestige economy is inextricably linked to conspicuous consumption and, sometimes, the extravagant destruction of property. If it were to occur under the worst case or resource abundance scenarios, it would be a prime target for Greene, Stokely and Christian's (1979:17) exhortation to proscribe non-essential activities, especially those that waste goods in short supply. In following this prescription, it is possible that post-disaster development of new currencies may, in fact, be obstructed or delayed.

The delayed reciprocity characteristic of prestige exchange may be a precursor of credit. Credit is necessary for coordinating trading activities where sale and purchase are not spatially or temporally coterminous. The risk imposed on the creditor, who has restricted information on the debtor and limited opportunities for mitigation, is a powerful disincentive for the emergence of a credit market.

However, an alternating balance of running debt is a powerful means of promoting social bonds between exchange partners. Prestige exchanges encourage this kind of risk taking between traders, who show off their status and wealth precisely by displaying how much they stand to lose if their partner defaults. At the same time, the action signals good faith and develops an atmosphere of trust, as well as rivalry. As the prestige network expands, the use of delayed reciprocity for prestige prestations may encourage a growing population of traders to extend credit in the non-prestige exchanges. This is yet another reason to be very careful in attempting to restrict non-essential trading and conspicuous consumption on the road to post-attack recovery.

10.3 DEMAND AND SUPPLY

Many studies addressing economic recovery assume that the objective of post-attack policy actions is the immediate restoration of the capitalist industrial system. However, our analysis indicates that more attention must be focused on the process of conferring value on goods after nuclear war.

First, there will be major shifts in supply and demand conditions for any good. This occurs where all resources to produce the good become scarce, as in the institution intensive or worst case scenarios, or where its ability to satisfy the wants of demanders is destroyed, as is the case under resource abundance. Hence, the supply of some items previously in common use may become scarce and prohibitively expensive, such as communication services, or they may become unusable, such as a tractor without gasoline or a viable substitute. In the first case, the good is very valuable, in the second it is not. Such changes in demand functions must be anticipated in preparing policies for the allocation of scarce resources in reconstruction, especially where missing markets for information prevent the planner from relying on price signals for guidance.

Second, because certain goods are unavailable, the uses to which they are put may systematically lose their attractiveness over time. This may occur in the resource abundance scenario as well as the low-

resource scenarios because the surviving social structures may have a strong incentive to shape the utility functions of their members to promote social cohesion. Hence, rules may emerge to limit the disruption caused by the expression of demands that cannot be satisfied. This socially modified demand function does not, therefore, rely on anti-technology or anti-industrial psychological reactions to nuclear war, but on the need to maintain social order and exchange itself. These changes in demand function must also be anticipated in planning for post-disaster recovery.

10.4 CHANGING MODES OF PRODUCTION

The scale and locus of productive labor may shift radically in post-disaster markets. As diversity of labor expands, traditional rules become less and less applicable to the choice over how income is earned and what can be done with it. Thus, it is unclear whether diversity is really an outcome of the market process or the stimulus needed to generate it.

The expansion of labor skills into specialized areas undermines a system of universal traditional rules. When everyone can do everything, all possess the knowledge and means to regulate each other's behavior. It is the expert who defies universal regulation, not only because he has proprietary information, but also because every expert, by definition, possesses some specialized skills not found in the average member of society at large. Thus, many professionals and craftsmen are regulated by their own professional groups or guilds, rather than subject to general labor restrictions.

Labor specialization makes members of a social unit highly interdependent, hence more vulnerable to severe losses in the absence of our market society. The loss of markets in the resource abundance scenario and the destruction of resources in the worst case inevitably will reduce the range of goods and services. The resulting drastic reduction in specialized labor and development of a domestic mode of production will, in turn, reduce further the incentives for market behavior, and encourage reliance on fixed rules of allocation. Therefore, it may be very difficult for potential middlemen to rekindle true market activity.

10.5 TRUST AND AUTHORITY

A pervasive problem facing all traders and decision makers in the novel circumstances of nuclear-war survival will be the issue of trust. In scenarios with low survival of institutions, licensing, certification, and consumer-rights authorities will be severely curtailed. People will experience increased difficulty in deciding who to trust, who has the skills that they advertise, and who will behave with fiduciary responsibility. The closer society is to pre-attack circumstances, the more trust will be retained by surviving institutions, such as those discharged with the responsibilities for economic recovery described in the best case.

However, even under the institution intensive conditions, surviving institutions will have to exercise great care in the planning and execution of policy. For example, failure to respond to popular demand for regulation under conditions of high infrastructure and low resources may well compromise government's authority as an equitable decision maker, capable of guiding post-war recovery. Equally dangerous, would be the tendency to regulate and even eliminate exchange activities that might make a valuable, if not always obvious, contribution to the restoration of currency, credit, and social cohesion.

One of the more critical problems to be faced by surviving institutions will be the maintenance of authority. This will be exacerbated where resources have suffered heavy damage, because the institutions will not be able to sustain long-term compliance through physical or material coercion.

Some argue that authority ultimately rests on the power to coerce. This view is certainly consistent with our description of the worst case. Analysis of the institution intensive scenario indicates that authority may stem equally from consensus about fixed allocations, where the patterns of exchange incentives are structured so as to promote social bonding. Under these conditions, the decision maker may be faced with a trade-off between promoting competitive incentives for allocations to encourage middleman activity, and maintaining the stability of civil society.

Where infrastructure is largely eliminated, especially as it is under the conditions of resource abundance, the emergence of prestige exchange may prove to be an important substitute for formal regulation, replacing legal sanctions by moral sanctions and possible loss of face. We argued in chapter eight that civil society, based on interpersonal trust and regulated by traditional ethics, was the condition for the emergence of the modern market system.

10.6 THE SHIFT FROM NON-MARKET TO MARKET STRUCTURES

Having considered some of the conclusions from the static analysis of the scenarios, we can also suggest some propositions about the dynamic features of economic recovery. Our scenarios can be seen as starting from a worst case system of low resources and low institutional survival that eventually moves to greater economic flexibility either through greater resource accumulation or institutional development. Thus, our resource abundance and institution intensive scenarios can be used as various pathways to the type of social organization that precedes the best case world.

Starting from the worst case, the presence of fixed rules of allocation within exchange structures may largely be responses to the severe transaction costs implied by initiating and completing exchanges. These rules will limit exchange opportunities by restricting permissible choices among traders. Thus, these rules may be an impediment to the development of a market process.

On the other hand, the traditional rules encourage activities that are necessary precursors to many social functions that constitute formal market structures. These activities include delayed reciprocity and the extension of credit; definition of property rights; signaling of good faith and credibility; and demonstration of sanctions for rule violations. We argued that these activities may encourage the development of credit and currency systems, an atmosphere of trust, and contract compliance among traders.

However, to have truly a market process, the rules of fixed allocations must begin to be superseded by rules that extend the transaction choices available to trading agents. Innovation in the rules leading to greater flexibility may be stimulated by either internal or external conditions, always present in a changing social and physical environment. Increases in the division of labor may be one such condition, contact with another exchange structure may be another.

Flexibility in the worst case system increases with greater resources (and less violent competition for basic survival) and greater institutional development as exchange relationships are fostered by a more regulated environment. However as flexibility is initially introduced to the structural rules, it promotes the opportunity to exploit gains from trade and contributes to a higher mobility of resources among traders and other exchange structures.

The expansion of potential trade opportunities combined with the established environment of civil order provides the incentives necessary for the emergence of middlemen. These market facilitators respond to incentives offered by the more flexible structure and can do so because the transaction costs of identification, negotiation, and enforcement are within tolerable levels. Perhaps facilitated by the development of a currency system, these middlemen act to separate the sale and purchase activities of traders, and thereby contribute further to the flexibility of rules governing what is now a market process.

The extent of competition in the rules of the market structure will ultimately depend upon the ability of the middlemen and corporate groups to obtain and direct resources for production and/or consumption as specified by the rules of property rights and extra-market regulation. Where these rules imply great flexibility over transaction options, and regulations imply free mobility of resources, there will be little need for middlemen, since traders can effect their own transactions directly, i.e., we are in, or close to, the world of perfect competition. Where these rules imply the opportunity for middle men to have exclusive control over resources and thus, their mobility, monopoly or oligopoly structures are possible, and even likely.

In essence, some constraint of choices, through market rules or through transaction costs, is necessary for the sustained profitability of middlemen and corporate groups. To the extent that these entities facilitate a market structure's ability to adapt to a changing environment, some encouragement of their continued presence may be desirable. For example, product differentiation through innovation is enhanced by patent rules, and information about product quality and

brand name differentiation is encouraged through trademark rules. By introducing some minor restrictions on market entry or exit, e.g., proprietary information, into the market structure to allow limited market power, the conditions for imperfect competition are created.

10.7 FURTHER RESEARCH

The analysis of the scenarios suggests a number of areas that warrant further research in order to understand better the implications of alternative policy prescriptions for economic recovery in the post-attack environment. Our analysis is exploratory, in the sense that it seeks to highlight the logical possibilities for exchange activities and then investigate the rules under which these activities may transpire. As a result, our study points out specific questions regarding exchange activity and economic recovery that must be investigated in a more narrowly focused analysis.

Three topics that require more investigation for policy purposes are property rights, currency versus barter, and trust and authority. We find these topics to be central concerns in each of the scenarios. We recommend that a more focused analysis of each topic be undertaken to provide the basis for concrete policy recommendations for FEMA disaster planning and post-disaster action in those cases where government institutions survive.

Two aspects of the problem not addressed by our study are the macroeconomic effects and the international implications of nuclear war. These issues are being addressed currently by other research studies sponsored by FEMA. In order to assess the potential routes of economic recovery fully, a complementary understanding of these various perspectives is required.

At a more micro-level of analysis, further insight on recovery options could be gained by testing empirically the behavioral responses of economic agents to changing economic conditions and rules governing exchange. This may be done using experimental economics techniques, where the behavioral responses of traders presented with various rules can be observed. Another possibility is to conduct field analyses of persons or groups that regularly engage in exchange activities that largely reflect the dominant rules of one or another of the exchange structures outlined in our study. This would allow a more detailed understanding of how people actually react to the exchange rules they face.

While our study does explore some aspects of the relative resource and institution survival, more detail aspects could assist in fine tuning policy prescriptions. For example, in the institution intensive scenario, we look at a world where it is assumed that it is largely government institutions that survive. Thus, our scenario suggests a world that has a large public sector relative to the private counterpart. Similarly, the resource abundance scenario assumes a world where agricultural and extraction resources are plentiful relative to other resource types. This could be extended to explore different

public/private sector and resource relationships by using a damage-assessment model to identify scenarios involving regional damages.

Finally, one of the unresolved issues that emerges from the research pertains to the dynamic properties of exchange structures. Specifically, we encourage more consideration of how market activities may be managed to evolve from structures that are characterized by fixed rules of allocation. Our study hints at a natural progression from fixed allocations to market activities when old rules are superseded by rules that extend the available transaction choices. In the case of western industrial economic evolution, this process took several hundred years. Thus, there remain unanswered questions regarding the dynamic possibilities under post-attack conditions. A logical next step in the research is to explore to what extent policy actions could be used to manage the evolution of exchange structures to produce desired economic systems.

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APPENDIX A

RULES VECTOR NOTATION FOR EXCHANGE SYSTEMS

RULES VECTOR NOTATION:

 $R_{ij}(d_1, \dots, d_n, s_1, \dots, s_n, t_1, \dots, t_n)$

where $i = 1, 2, 3, 4$ (scenarios)

$j = 1, \dots, k$ (exchange structures within a scenario)

d_x = the demand rules, $x = 1, \dots, n$

s_x = the supply rules, $x = 1, \dots, n$

t_x = the transaction rules, $x = 1, \dots, n$.

DEMAND RULES:

d_1 Who may demand a good or service?

d_2 How is consumption to be shared?

d_3 Is the good or service divisible or indivisible? This refers to the durability of the good or to what extent its consumption represents a significant portion of the consumer's income.

d_4 Is demand for survival or status? This is closely related to when demand occurs and if it is an immediate need.

SUPPLY RULES:

s_1 Who may supply a good or service?

s_2 Where does supply occur?

s_3 When does supply occur?

s_4 Is supply storable?

s_5 Are there technical, institutional (other than the institutional rules of the vector), or natural constraints on supply?

s_6 What are the major uncertainties facing suppliers?

s_7 Is the product or service homogeneous or differentiated?

TRANSACTION RULES:

t_1 Who holds the title to property as it is recognized within the exchange structure?

- t₂ Who holds the entitlement to use and manage the property? This is related to the condition of universality, where all resources are owned privately and all entitlements are completely specified.
- t₃ Does the condition of exclusivity (where all costs and benefits of owning and using the property accrue to the owners) apply?
- t₄ Does the condition of transferability (where all rights are transferable in a voluntary exchange) apply?
- t₅ Does the condition of enforceability (where property rights are secure from involuntary seizure or encroachment by others) apply?
- t₆ How are bids to buy made?
- t₇ Where are bids to buy made?
- t₈ When are bids to buy made?
- t₉ How are offers to sell made?
- t₁₀ Where are offers to sell made?
- t₁₁ When are offers to sell made?
- t₁₂ What is the medium of exchange? How are goods or services priced?
- t₁₃ How are transactions legitimated?
- t₁₄ How are transactions enforced?
- t₁₅ How is information distributed in the exchange structure?
- t₁₆ How are adjustments made for externalities?

APPENDIX B

TABLE OF RULES VECTORS FOR EXCHANGE SYSTEMS

DEMAND RULES

 d_1 Who may demand a good or service?

Subsistence	Members of consumption/production group
Prestige	Individuals of comparable status
Intimate	Members of transitive networks
Associational	Members of extended networks
Peasant Marketplace	Anyone with money or goods to exchange
Perfect Competition	Large numbers of buyers
Imperfect Competition	Large numbers of buyers
Oligopoly	Large numbers of buyers
Unregulated Monopoly	Large numbers of buyers

 d_2 How is consumption to be shared?

Subsistence	Fixed allocation in production/consumption group
Prestige	At discretion of demander among supporters
Intimate	According to positive reciprocity in network
Associational	Generally not shared
Peasant Marketplace	At discretion of buyer within extended family
Perfect Competition	Not shared
Imperfect Competition	Not shared
Oligopoly	Not shared
Monopoly	Not shared

d₃ Is the good or service divisible or indivisible?

Subsistence	Divisible
Prestige	Lumpy
Intimate	Depends on good or service
Associational	Depends on good or service
Peasant Marketplace	Divisible
Perfect Competition	Divisible
Imperfect Competition	Divisible
Oligopoly	Divisible
Monopoly	Divisible

d₄ Is demand for survival or status?

Subsistence	Survival
Prestige	Status
Intimate	May be either or both
Associational	Usually Status
Peasant Marketplace	Usually survival
Perfect Competition	Not distinguished
Imperfect Competition	Not distinguished
Oligopoly	Not distinguished
Unregulated Monopoly	Not distinguished

SUPPLY RULES**s₁ Who may supply a good or service?**

Subsistence	Members of production/consumption group. Also constrained by kinship category and sexual division of labor
Prestige	Individuals of comparable status
Intimate	Members of transitive networks

Associational	Network members with access to goods or services
Peasant Marketplace	Anyone with money or goods to trade.
Perfect Competition	Free entry and exit. No positive return to coalition formation
Imperfect Competition	Number of buyers and sellers sufficient to preclude dominant market power
Oligopoly	A few large suppliers dominate total supply
Unregulated Monopoly	Single controller of good or service

s₂ Where does supply occur?

Subsistence	Within the production/consumption group
Prestige	Supporters supply leaders and leaders supply each other
Intimate	Within transitive networks
Associational	Goods from formal sector enter extended networks for internal exchange
Peasant Marketplace	Production on peasant smallholdings
Perfect Competition	Anywhere because of perfect resource mobility
Imperfect Competition	Almost anywhere because high resource mobility
Oligopoly	Depends on good or service
Unregulated Monopoly	Depends on good or service

s₃ When does supply occur?

Subsistence	When resources are available, often seasonally
Prestige	When sufficient surplus is available to pay creditor and increase scale of debt
Intimate	Goods depend on availability/Services continuous
Associational	Goods depend on availability/Services continuous
Peasant Marketplace	When resources are available, often seasonally

Perfect Competition	When the opportunity exists for normal profits
Imperfect Competition	Supply likely to depend on input availability
Oligopoly	Supply likely to depend on input availability
Unregulated Monopoly	Supply likely to depend on input availability supplemented by storage

s₄ Is supply storable?

Subsistence	Very limited, such as dried, salted, or smoked products or on the hoof
Prestige	As durable items or livestock
Intimate	Services stored in skills of members, goods stored centrally but seldom
Associational	Storage unlikely due to high opportunity costs
Peasant Marketplace	Very limited, such as dried, salted, or smoked products or on the hoof
Perfect Competition	Absence of uncertainties or constraints on access make storage irrational
Imperfect Competition	Limited to a level that just covers cost
Oligopoly	Depends on technology and future profit expectations
Unregulated Monopoly	Depends on technology and future profit expectations

s₅ Are there technical, institutional (other than the institutional rules of the vector), or natural constraints on supply?

Subsistence	Low level of technology, simple division of labor and problems of coordination, internal distributive rules, seasonal variation in supply, weather, and soil quality
Prestige	Availability of goods, obligations to other partners and specific nature of goods, scarcity of goods and, in long-distance exchanges, weather
Intimate	Depends on network size, ability to obtain resources, and competence of network members

Associational	Depends on policing of formal markets, pricing relative to formal markets, and formal occupation of supplier
Peasant Marketplace	Low level of technology, reliance on human labor power, land-tenure patterns, low-level division of labor, coordination problems, seasonal variation, weather, soil quality, availability of raw materials for craft activities
Perfect Competition	No differential constraints on supply. Constraints arise from competitive behavior and profit maximization
Imperfect Competition	None on whole industry, but individual suppliers are not truly identical
Oligopoly	Economies of scale or mergers generate small number of suppliers
Unregulated Monopoly	Barrier to entry depends on control over resources

s₆ What are the major uncertainties facing suppliers?

Subsistence	Seasonal fluctuations in availability and predatory raiding by other groups or animals
Prestige	Coordinating assembly of goods at appropriate time and ability of recipient to reciprocate
Intimate	Resource availability and maintenance of skill inventories
Associational	State of formal economy and levels of its policing affect availability
Peasant Marketplace	Seasonal/weather conditions and public-health effects on labor power
Perfect Competition	None, suppliers have full information
Imperfect Competition	Ability to retain small market shares
Oligopoly	Reactions of rivals to price and output changes
Unregulated Monopoly	Control and duration of market power

s₇ Is the product or service homogeneous or differentiated?

Subsistence	Largely homogeneous
Prestige	Where individual items may be homogeneous, prestige depends on the size of the package of those goods, hence the products are effectively differentiated
Intimate	Goods tend to be differentiated, services tend to be homogeneous
Associational	Goods and services are differentiated
Peasant Marketplace	Agricultural goods tend to be homogeneous craft goods may be differentiated
Perfect Competition	Goods and services are homogeneous
Imperfect Competition	Slight differentiation for competitive edge
Oligopoly	Both homogeneous and differentiated
Unregulated Monopoly	Completely differentiated because unique product

TRANSACTION RULES**t₁ Who holds the title to property as it is recognized within the exchange structure?**

Subsistence	Major productive resources likely to be open-access or common property
Prestige	Demander/suppliers heading kin or local groups
Intimate	Individual members of transitive networks
Associational	Trading agents in extended networks
Peasant Marketplace	Supplier holds title to produce, but often not to land
Perfect Competition	Individual owners or corporate entities
Imperfect Competition	Individual owners or corporate entities
Oligopoly	Individual owners or corporate entities
Unregulated Monopoly	Individual owners or corporate entities

t₂ Who holds entitlement to use and manage property?

Subsistence	All members of household group whose leader is recognized as legitimate manager
Prestige	Use is at the discretion of demander/suppliers heading kin or local groups
Intimate	Management by transitive network, temporary use granted to any member
Associational	Any trading agent
Peasant Marketplace	Head of producer household except as limited by t ₁
Perfect Competition	All owners
Imperfect Competition	All owners
Oligopoly	Small number of suppliers can use market power to limit subsequent use
Unregulated Monopoly	Sole supplier can use market power to limit subsequent use

t₃ Does the condition of exclusivity apply?

Subsistence	Seldom applies to nominal owner because constrained by obligations to household production/consumption group
Prestige	No, because of conspicuous consumption rules
Intimate	Not to title holder, but to extended network
Associational	Only in absence of externalities in use
Peasant Marketplace	So far as goods and services are treated as private property
Perfect Competition	Yes, in production and consumption
Imperfect Competition	Yes, but some excess-capacity externalities
Oligopoly	Not necessarily, market power may permit avoidance of some costs
Unregulated Monopoly	Market power likely to encourage avoidance of some costs

t₄ Does the condition of transferability of all rights apply?

Subsistence	Seldom, because high level of interdependence requires group consensus
Prestige	Varies according to nature of goods
Intimate	Applies to titleholder
Associational	Applies to titleholder
Peasant Marketplace	Except for land and obligatory labor
Perfect Competition	Applies to titleholder
Imperfect Competition	Applies to titleholder
Oligopoly	Applies to titleholder
Unregulated Monopoly	Applies to titleholder

t₅ Does the condition of enforceability apply?

Subsistence	Usually through pressure from kinship group
Prestige	Through repeated transactions and shaming
Intimate	By consent, not within transitive network
Associational	By exclusion from the network, threats of retribution, or appeals to the extra-market legal system
Peasant Marketplace	By repeat transaction and community legal system
Perfect Competition	Yes
Imperfect Competition	Yes
Oligopoly	Yes
Unregulated Monopoly	Yes

t₆ How are bids to buy made?

Subsistence	Internally are constantly signaled through the production/consumption group. Externally, bids to buy are initiated as offers to supply
Prestige	Through hints and complaints

Intimate	By direct expression of need
Associational	Through comparisons with goods and services in formal markets
Peasant Marketplace	Inquiry about asking price followed by haggling Likely preference for trade with established partner
Perfect Competition	Buyers are price takers at seller's retail outlets
Imperfect Competition	Buyers are price takers at seller's retail outlets
Oligopoly	Buyers are price takers at seller's retail outlets
Unregulated Monopoly	Buyers are price takers at seller's retail outlets

t₇ Where are bids to buy made?

Subsistence	Internally, within production/consumption unit Externally, at established places of exchange
Prestige	Between leaders and between leaders and followers
Intimate	In daily interaction of the transitive network
Associational	By agreement of buyer and seller
Peasant Marketplace	At a customary marketplace
Perfect Competition	Effectively anywhere, otherwise there would be differential access to the market
Imperfect Competition	Bids for generic product may be made anywhere. Bids for specific brands may be restricted to certain supply outlets
Oligopoly	At outlets determined by seller rivalry
Unregulated Monopoly	At outlets determined by seller's market power

t₈ When are bids to buy made?

Subsistence	According to availability
Prestige	When buyer knows seller has resources and appropriate time has elapsed since last exchange
Intimate	When buyers express need
Associational	At any time
Peasant Marketplace	At regular intervals established by custom
Perfect Competition	At any time
Imperfect Competition	At any time for generic product. Access to specific brands may be restricted at certain times
Oligopoly	At times determined by seller rivalry
Unregulated Monopoly	At times determined by seller's market power

t₉ How are offers to sell made?

Subsistence	Asymmetrical to t ₆ , without expectation of immediate return within group
Prestige	To most effectively pressing creditor
Intimate	Without expectation of direct return
Associational	With expectation of immediate return
Peasant Marketplace	By displaying goods
Perfect Competition	Sellers are price takers but control quantity
Imperfect Competition	Sellers have limited price-setting ability
Oligopoly	Sellers may collude, act as rivals, or use price leadership
Unregulated Monopoly	Sets price to maximize monopoly rents

t₁₀ Where are offers to sell made?

Subsistence	Internally, within production/consumption unit Externally, at established places of exchange
Prestige	Between leaders and between leaders and followers
Intimate	In daily interaction of the transitive network
Associational	By agreement of buyer and seller
Peasant Marketplace	At a customary marketplace
Perfect Competition	Effectively everywhere, otherwise there would be differential access to the market
Imperfect Competition	May be made at retail outlets or signaled through advertising, sealed bids, or central auction
Oligopoly	May be made at retail outlets or signaled through advertising or sealed bids
Unregulated Monopoly	Determined by monopolist to maintain market control

t₁₁ When are offers to sell made?

Subsistence	When resources are available
Prestige	When resources are available and pressures are applied by exchange partner. Also to regain status lost through independent humiliation
Intimate	When resources are available, a buyer expresses need, and a running debt balance is maintained
Associational	When goods and services are available from formal market
Peasant Marketplace	When marketplaces are open
Perfect Competition	In short run, when price covers variable costs In long run, when price covers average costs
Imperfect Competition	In short run, when price covers variable costs In long run, when price covers average costs
Oligopoly	At times determined by seller rivalry or resource availability

Unregulated Monopoly When seller determines that the difference between marginal revenue and marginal costs is maximized

t₁₂ What is the medium of exchange? How are goods and services priced?

Subsistence	No general medium of exchange or measure of value used. External exchange by direct barter
Prestige	Prices established by convention, paid in a limited range of customarily recognized goods
Intimate	Prices negotiable after transaction. Exchange is by direct barter with delayed reciprocity
Associational	Prices are established prior to consumption, valued in money, but need not be medium of exchange
Peasant Marketplace	Price fixed through haggling, paid in cash or barter for monetary equivalent
Perfect Competition	Costless medium of exchange required to value products, or a costless auctioneer to set relative prices
Imperfect Competition	Prices not negotiated, paid in money
Oligopoly	Prices not negotiated, paid in money
Unregulated Monopoly	Prices not negotiated, paid in money

t₁₃ How are transactions legitimated?

Subsistence	By adherence to customary rules in the group and by repeat exchange outside
Prestige	Through feasting or other conspicuous consumption
Intimate	Through membership in network signaled by maintaining running debt balance
Associational	By consent of trading agents
Peasant Marketplace	By consent symbolized through customary signals
Perfect Competition	By consent of trading agents subject to extra-market legal and regulatory system

Imperfect Competition	By consent of trading agents subject to extra-market legal and regulatory system
Oligopoly	By consent of trading agents subject to extra-market legal and regulatory system
Unregulated Monopoly	By consent of trading agents subject to extra-market legal and regulatory system

t₁₄ How are transactions enforced?

Subsistence	Through shame, ridicule and ostracism inside the group. Through repeat transaction outside
Prestige	Through shaming, ridicule, and exclusion from the exchange structure
Intimate	Moral pressure, verbal aggression, ridicule, expulsion
Associational	Repeat exchange or competition from formal sources
Peasant Marketplace	Repeat exchange, action of a market patron, or the extra-market legal system
Perfect Competition	Repeat exchange and competition from other buyers and sellers
Imperfect Competition	Repeat exchange and competition from other buyers and sellers
Oligopoly	On demand side by threat of withdrawing supply. On supply side by presence of rivals
Unregulated Monopoly	Threat to withdraw supply

t₁₅ How is information distributed in the exchange structure?

Subsistence	Symmetrical and free in the group, restricted and costly outside
Prestige	Participants try to restrict information about resources to defer creditors, but information about comparative values is ubiquitous
Intimate	Symmetrical and free within transitive network

Associational	Asymmetrical because supply may be illicit and value of products to buyers is costly to collect
Peasant Marketplace	Information costs reduced by bringing buyers and sellers together
Perfect Competition	Perfectly symmetrical and free
Imperfect Competition	Limited asymmetry in information about the uniqueness of the product
Oligopoly	Asymmetrical between suppliers and demanders, as well as between rival producers
Unregulated Monopoly	Supply information very restricted

t₁₆ How are adjustments made for externalities?

Subsistence	Externalities usually inherent, may motivate exchange to provide social cohesion
Prestige	Purpose is to generate externalities to promote social cohesion
Intimate	Corrected by running debt balance in the network
Associational	Externalities not adjusted within the network
Peasant Marketplace	Usually go unrecognized, but may be negotiated
Perfect Competition	Eliminated by costless negotiation
Imperfect Competition	Generally not adjusted internally, may be adjusted by regulation
Oligopoly	Generally not adjusted
Unregulated Monopoly	Absorbed by consumers due to low market power

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MARKETS, DISTRIBUTION,
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SOCIETAL CATACLYSM

Unclassified
November 1989 -167 Pages

by R. A. Cantor, S. Henry, S. Rayner
Oak Ridge National Laboratory, Oak Ridge, TN 37831
Interagency Agreement: FEMA EMW-84-E-1737

The report identifies constraints and opportunities for the restoration of economic exchange following nuclear war. Four survival scenarios are postulated based on high or low levels of damage to (1) institutions that signal trading opportunities, reduce transaction costs, and regulate and enforce contracts, and (2) resources that are used to create and define wealth. The four scenarios are best case, worst case, resource abundance, and an institution intensive case.

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This procedure yielded a range of tentative conclusions for all four scenarios. First, property rights in surviving resources are likely to be problematic in all but the best case and may place severe pressures on dispute resolution mechanisms and civil order.

Second, barter is not always less efficient than money, as is usually assumed. It may overcome trading difficulties where prices take time to adjust to changing supply and demand information. Attempts to restore currency where national institutions have been destroyed, will depend upon the credibility of the institution that emerges to underwrite it.

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Fourth, planning for the recovery of markets for particular goods should recognize that there will be major shifts in supply and demand. The value of goods and services may undergo tremendous changes that are difficult to detect from price information, even where it is available. Also, the uses to which goods and services are put systematically lose lose their attractiveness because of socially generated changes in demand.

Fifth, a critical problem will be the maintenance of trust and authority. The more drastic the change from pre-attack society, the more difficulty people may have in deciding whom to trust, who has the skills that they advertise, and who will behave with fiduciary responsibility.

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